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Spent Fuel Library Report

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1 Nuclear Contributions

1.1 Absorptions by Isotope

1.1.1 15 GWd, 2% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	48.996
^{239}Pu	15.822
^{240}Pu	9.572
^{235}U	8.035
^{149}Sm	2.350
^{241}Pu	2.153
^{143}Nd	1.799
^{151}Sm	1.099
other	10.174

Table 1: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 2.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.2 15 GWd, 2% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	48.653
^{239}Pu	15.711
^{240}Pu	9.494
^{235}U	7.991
^{149}Sm	2.332
^{143}Nd	1.779
^{241}Pu	1.762
^{241}Am	1.121
^{151}Sm	1.054
other	10.103

Table 2: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 2.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.3 15 GWd, 2% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	47.940
^{239}Pu	15.497
^{240}Pu	9.344
^{235}U	7.895
^{241}Am	3.022
^{149}Sm	2.314
^{143}Nd	1.764
^{155}Gd	1.516
other	10.707

Table 3: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 2.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.4 15 GWd, 2% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	47.650
^{239}Pu	15.434
^{240}Pu	9.230
^{235}U	7.891
^{241}Am	4.351
^{149}Sm	2.308
^{143}Nd	1.774
^{155}Gd	1.604
other	9.758

Table 4: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 2.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.5 15 GWd, 3% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	47.494
^{239}Pu	14.708
^{235}U	13.358
^{240}Pu	7.947
^{149}Sm	2.432
^{143}Nd	1.707
^{241}Pu	1.490
^{151}Sm	1.131
other	9.734

Table 5: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 3.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.6 15 GWd, 3% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	47.285
^{239}Pu	14.637
^{235}U	13.308
^{240}Pu	7.894
^{149}Sm	2.429
^{143}Nd	1.698
^{241}Pu	1.220
^{151}Sm	1.101
other	10.427

Table 6: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 3.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.7 15 GWd, 3% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	46.808
^{239}Pu	14.493
^{235}U	13.195
^{240}Pu	7.813
^{149}Sm	2.404
^{241}Am	2.213
^{143}Nd	1.683
^{155}Gd	1.032
other	10.360

Table 7: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 3.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.8 15 GWd, 3% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	46.615
^{239}Pu	14.435
^{235}U	13.200
^{240}Pu	7.726
^{241}Am	3.185
^{149}Sm	2.403
^{143}Nd	1.682
^{155}Gd	1.094
other	9.661

Table 8: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 3.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.9 15 GWd, 4% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	46.055
^{235}U	17.994
^{239}Pu	13.488
^{240}Pu	6.766
^{149}Sm	2.525
^{143}Nd	1.549
^{151}Sm	1.151
^{241}Pu	1.051
other	9.420

Table 9: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 4.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.10 15 GWd, 4% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	45.905
^{235}U	17.949
^{239}Pu	13.458
^{240}Pu	6.753
^{149}Sm	2.520
^{143}Nd	1.547
^{151}Sm	1.120
other	10.749

Table 10: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 4.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.11 15 GWd, 4% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	45.574
^{235}U	17.853
^{239}Pu	13.359
^{240}Pu	6.684
^{149}Sm	2.507
^{241}Am	1.648
^{143}Nd	1.537
other	10.839

Table 11: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 4.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.12 15 GWd, 4% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	45.415
^{235}U	17.836
^{239}Pu	13.312
^{240}Pu	6.630
^{149}Sm	2.513
^{241}Am	2.374
^{143}Nd	1.538
other	10.381

Table 12: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 4.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.13 15 GWd, 5% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	44.703
^{235}U	21.929
^{239}Pu	12.378
^{240}Pu	5.850
^{149}Sm	2.619
^{143}Nd	1.402
^{151}Sm	1.158
^{236}U	1.027
other	8.935

Table 13: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 5.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.14 15 GWd, 5% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	44.614
^{235}U	21.899
^{239}Pu	12.357
^{240}Pu	5.839
^{149}Sm	2.609
^{143}Nd	1.402
^{151}Sm	1.122
^{236}U	1.040
other	9.118

Table 14: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 5.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.15 15 GWd, 5% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	44.378
^{235}U	21.791
^{239}Pu	12.290
^{240}Pu	5.793
^{149}Sm	2.605
^{143}Nd	1.397
^{241}Am	1.273
^{236}U	1.044
other	9.428

Table 15: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 5.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.16 15 GWd, 5% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	44.265
^{235}U	21.787
^{239}Pu	12.245
^{240}Pu	5.742
^{149}Sm	2.608
^{241}Am	1.838
^{143}Nd	1.397
^{236}U	1.040
other	9.077

Table 16: Isotopes that capture more than 1% of all the captures in assembly H2O, 15.0 GWd, 5.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.17 30 GWd, 2% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	42.859
^{239}Pu	15.929
^{240}Pu	12.754
^{241}Pu	3.837
^{235}U	2.992
^{143}Nd	2.463
^{149}Sm	2.187
^{151}Sm	1.280
^{131}Xe	1.022
other	14.678

Table 17: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 2.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.18 30 GWd, 2% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	42.153
^{239}Pu	15.640
^{240}Pu	12.527
^{241}Pu	3.111
^{235}U	2.940
^{143}Nd	2.425
^{149}Sm	2.158
^{155}Gd	2.095
^{241}Am	2.018
^{151}Sm	1.215
^{131}Xe	1.006
other	12.712

Table 18: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 2.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.19 30 GWd, 2% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	40.939
^{239}Pu	15.218
^{240}Pu	12.202
^{241}Am	5.253
^{155}Gd	3.693
^{235}U	2.874
^{143}Nd	2.376
^{149}Sm	2.111
^{241}Pu	1.475
^{151}Sm	1.063
other	12.796

Table 19: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 2.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.20 30 GWd, 2% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	40.420
^{239}Pu	15.114
^{240}Pu	12.076
^{241}Am	7.505
^{155}Gd	3.911
^{235}U	2.879
^{143}Nd	2.370
^{149}Sm	2.107
other	13.617

Table 20: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 2.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.21 30 GWd, 3% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	41.905
^{239}Pu	15.875
^{240}Pu	11.478
^{235}U	6.336
^{241}Pu	3.260
^{143}Nd	2.557
^{149}Sm	2.262
^{151}Sm	1.300
^{131}Xe	1.026
^{133}Cs	1.006
other	12.993

Table 21: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 3.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.22 30 GWd, 3% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	41.342
^{239}Pu	15.642
^{240}Pu	11.331
^{235}U	6.257
^{241}Pu	2.652
^{143}Nd	2.525
^{149}Sm	2.241
^{241}Am	1.799
^{155}Gd	1.609
^{151}Sm	1.249
^{131}Xe	1.011
other	12.342

Table 22: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 3.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.23 30 GWd, 3% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	40.356
^{239}Pu	15.306
^{240}Pu	11.070
^{235}U	6.128
^{241}Am	4.674
^{155}Gd	2.843
^{143}Nd	2.486
^{149}Sm	2.203
^{241}Pu	1.260
^{151}Sm	1.090
other	12.584

Table 23: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 3.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.24 30 GWd, 3% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	39.938
^{239}Pu	15.191
^{240}Pu	10.906
^{241}Am	6.670
^{235}U	6.120
^{155}Gd	3.017
^{143}Nd	2.487
^{149}Sm	2.188
other	13.483

Table 24: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 3.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.25 30 GWd, 4% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	40.895
^{239}Pu	15.543
^{240}Pu	10.349
^{235}U	10.019
^{241}Pu	2.684
^{143}Nd	2.479
^{149}Sm	2.342
^{151}Sm	1.311
^{236}U	1.193
^{133}Cs	1.021
^{131}Xe	1.018
other	11.147

Table 25: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 4.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.26 30 GWd, 4% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	40.479
^{239}Pu	15.371
^{240}Pu	10.247
^{235}U	9.926
^{143}Nd	2.460
^{149}Sm	2.319
^{241}Pu	2.194
^{241}Am	1.559
^{151}Sm	1.258
^{155}Gd	1.212
^{236}U	1.207
^{133}Cs	1.006
^{131}Xe	1.006
other	9.755

Table 26: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 4.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.27 30 GWd, 4% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	39.689
^{239}Pu	15.097
^{240}Pu	10.036
^{235}U	9.763
^{241}Am	4.058
^{143}Nd	2.412
^{149}Sm	2.285
^{155}Gd	2.147
^{236}U	1.185
^{151}Sm	1.110
^{241}Pu	1.047
other	11.169

Table 27: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 4.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.28 30 GWd, 4% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	39.300
^{239}Pu	14.997
^{240}Pu	9.886
^{235}U	9.750
^{241}Am	5.800
^{143}Nd	2.414
^{149}Sm	2.281
^{155}Gd	2.267
^{236}U	1.171
other	12.135

Table 28: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 4.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.29 30 GWd, 5% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	39.924
^{239}Pu	15.035
^{235}U	13.545
^{240}Pu	9.368
^{149}Sm	2.433
^{143}Nd	2.329
^{241}Pu	2.198
^{236}U	1.344
^{151}Sm	1.320
^{133}Cs	1.018
^{131}Xe	1.005
other	10.482

Table 29: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 5.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.30 30 GWd, 5% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	39.611
^{239}Pu	14.916
^{235}U	13.448
^{240}Pu	9.283
^{149}Sm	2.419
^{143}Nd	2.311
^{241}Pu	1.803
^{236}U	1.364
^{241}Am	1.338
^{151}Sm	1.267
^{133}Cs	1.013
other	11.228

Table 30: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 5.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.31 30 GWd, 5% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	38.969
^{239}Pu	14.671
^{235}U	13.274
^{240}Pu	9.107
^{241}Am	3.489
^{149}Sm	2.395
^{143}Nd	2.280
^{155}Gd	1.647
^{236}U	1.353
^{151}Sm	1.116
other	11.700

Table 31: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 5.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.32 30 GWd, 5% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	38.659
^{239}Pu	14.570
^{235}U	13.237
^{240}Pu	8.986
^{241}Am	4.981
^{149}Sm	2.380
^{143}Nd	2.291
^{155}Gd	1.733
^{236}U	1.338
other	11.825

Table 32: Isotopes that capture more than 1% of all the captures in assembly H2O, 30.0 GWd, 5.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.33 45 GWd, 2% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	39.389
^{239}Pu	15.142
^{240}Pu	13.587
^{241}Pu	4.388
^{143}Nd	2.679
^{149}Sm	2.064
^{151}Sm	1.412
^{242}Pu	1.287
^{133}Cs	1.240
^{131}Xe	1.175
^{235}U	1.105
other	16.532

Table 33: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 2.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.34 45 GWd, 2% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	38.463
^{239}Pu	14.766
^{240}Pu	13.394
^{241}Pu	3.529
^{155}Gd	3.061
^{143}Nd	2.613
^{241}Am	2.312
^{149}Sm	2.029
^{151}Sm	1.342
^{242}Pu	1.260
^{133}Cs	1.212
^{131}Xe	1.153
^{235}U	1.080
other	13.786

Table 34: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 2.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.35 45 GWd, 2% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	37.029
^{239}Pu	14.259
^{240}Pu	13.141
^{241}Am	5.910
^{155}Gd	5.349
^{143}Nd	2.541
^{149}Sm	1.953
^{241}Pu	1.656
^{242}Pu	1.208
^{133}Cs	1.163
^{151}Sm	1.153
^{131}Xe	1.112
^{235}U	1.046
other	12.479

Table 35: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 2.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.36 45 GWd, 2% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	36.494
^{239}Pu	14.117
^{240}Pu	13.147
^{241}Am	8.420
^{155}Gd	5.663
^{143}Nd	2.533
^{149}Sm	1.956
^{242}Pu	1.185
^{133}Cs	1.152
^{131}Xe	1.091
^{237}Np	1.088
^{235}U	1.049
other	12.104

Table 36: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 2.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.37 45 GWd, 3% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	38.582
^{239}Pu	15.279
^{240}Pu	12.905
^{241}Pu	4.125
^{143}Nd	2.950
^{235}U	2.839
^{149}Sm	2.117
^{151}Sm	1.421
^{133}Cs	1.264
^{131}Xe	1.202
^{242}Pu	1.065
^{237}Np	1.022
other	15.229

Table 37: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 3.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.38 45 GWd, 3% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	37.826
^{239}Pu	14.955
^{240}Pu	12.696
^{241}Pu	3.327
^{143}Nd	2.886
^{235}U	2.780
^{155}Gd	2.671
^{241}Am	2.249
^{149}Sm	2.080
^{151}Sm	1.356
^{133}Cs	1.241
^{131}Xe	1.173
^{242}Pu	1.047
^{237}Np	1.002
other	12.712

Table 38: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 3.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.39 45 GWd, 3% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	36.548
^{239}Pu	14.500
^{240}Pu	12.407
^{241}Am	5.717
^{155}Gd	4.694
^{143}Nd	2.806
^{235}U	2.704
^{149}Sm	2.028
^{241}Pu	1.567
^{133}Cs	1.195
^{151}Sm	1.178
^{131}Xe	1.141
^{242}Pu	1.006
other	12.509

Table 39: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 3.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.40 45 GWd, 3% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	36.027
^{239}Pu	14.365
^{240}Pu	12.346
^{241}Am	8.147
^{155}Gd	4.965
^{143}Nd	2.802
^{235}U	2.703
^{149}Sm	2.022
^{237}Np	1.212
^{133}Cs	1.185
^{131}Xe	1.120
other	13.106

Table 40: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 3.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.41 45 GWd, 4% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	37.702
^{239}Pu	15.357
^{240}Pu	12.117
^{235}U	5.343
^{241}Pu	3.730
^{143}Nd	3.055
^{149}Sm	2.173
^{151}Sm	1.439
^{133}Cs	1.285
^{236}U	1.248
^{131}Xe	1.211
^{237}Np	1.071
other	14.269

Table 41: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 4.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.42 45 GWd, 4% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	37.100
^{239}Pu	15.100
^{240}Pu	11.910
^{235}U	5.254
^{241}Pu	3.025
^{143}Nd	2.999
^{155}Gd	2.209
^{241}Am	2.141
^{149}Sm	2.136
^{151}Sm	1.366
^{133}Cs	1.257
^{236}U	1.243
^{131}Xe	1.194
^{237}Np	1.052
other	12.014

Table 42: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 4.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.43 45 GWd, 4% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	35.993
^{239}Pu	14.687
^{240}Pu	11.609
^{241}Am	5.424
^{235}U	5.126
^{155}Gd	3.888
^{143}Nd	2.926
^{149}Sm	2.076
^{241}Pu	1.432
^{133}Cs	1.229
^{236}U	1.214
^{151}Sm	1.199
^{131}Xe	1.160
^{237}Np	1.050
other	10.987

Table 43: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 4.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.44 45 GWd, 4% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	35.502
^{239}Pu	14.554
^{240}Pu	11.514
^{241}Am	7.704
^{235}U	5.111
^{155}Gd	4.115
^{143}Nd	2.927
^{149}Sm	2.094
^{237}Np	1.255
^{133}Cs	1.215
^{236}U	1.187
^{131}Xe	1.146
other	11.676

Table 44: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 4.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.45 45 GWd, 5% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	36.913
^{239}Pu	15.317
^{240}Pu	11.242
^{235}U	8.168
^{241}Pu	3.302
^{143}Nd	2.988
^{149}Sm	2.247
^{236}U	1.448
^{151}Sm	1.443
^{133}Cs	1.293
^{131}Xe	1.216
^{237}Np	1.068
other	13.355

Table 45: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 5.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.46 45 GWd, 5% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	36.398
^{239}Pu	15.104
^{240}Pu	11.114
^{235}U	8.049
^{143}Nd	2.951
^{241}Pu	2.683
^{149}Sm	2.212
^{241}Am	1.995
^{155}Gd	1.779
^{236}U	1.451
^{151}Sm	1.376
^{133}Cs	1.273
^{131}Xe	1.194
^{237}Np	1.054
other	11.367

Table 46: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 5.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.47 45 GWd, 5% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	35.467
^{239}Pu	14.720
^{240}Pu	10.828
^{235}U	7.883
^{241}Am	5.032
^{155}Gd	3.148
^{143}Nd	2.887
^{149}Sm	2.174
^{236}U	1.422
^{241}Pu	1.276
^{133}Cs	1.250
^{151}Sm	1.205
^{131}Xe	1.169
^{237}Np	1.053
other	10.485

Table 47: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 5.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.48 45 GWd, 5% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	35.025
^{239}Pu	14.596
^{240}Pu	10.710
^{235}U	7.859
^{241}Am	7.152
^{155}Gd	3.319
^{143}Nd	2.890
^{149}Sm	2.170
^{236}U	1.396
^{237}Np	1.254
^{133}Cs	1.236
^{131}Xe	1.160
other	11.233

Table 48: Isotopes that capture more than 1% of all the captures in assembly H2O, 45.0 GWd, 5.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.49 60 GWd, 2% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	37.261
^{239}Pu	14.577
^{240}Pu	13.685
^{241}Pu	4.496
^{143}Nd	2.604
^{149}Sm	1.996
^{242}Pu	1.627
^{151}Sm	1.518
^{133}Cs	1.402
^{238}Pu	1.344
^{131}Xe	1.246
^{243}Am	1.050
^{99}Tc	1.048
other	16.146

Table 49: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 2.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.50 60 GWd, 2% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	36.320
^{239}Pu	14.189
^{240}Pu	13.578
^{241}Pu	3.594
^{155}Gd	3.570
^{143}Nd	2.520
^{241}Am	2.358
^{149}Sm	1.942
^{242}Pu	1.583
^{151}Sm	1.425
^{133}Cs	1.361
^{238}Pu	1.283
^{131}Xe	1.217
^{99}Tc	1.021
^{243}Am	1.015
other	13.025

Table 50: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 2.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.51 60 GWd, 2% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	34.801
^{239}Pu	13.592
^{240}Pu	13.581
^{155}Gd	6.171
^{241}Am	6.007
^{143}Nd	2.430
^{149}Sm	1.879
^{241}Pu	1.676
^{242}Pu	1.520
^{133}Cs	1.304
^{151}Sm	1.215
^{131}Xe	1.166
^{238}Pu	1.103
other	13.556

Table 51: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 2.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.52 60 GWd, 2% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	34.171
^{240}Pu	13.911
^{239}Pu	13.441
^{241}Am	8.502
^{155}Gd	6.536
^{143}Nd	2.423
^{149}Sm	1.865
^{242}Pu	1.477
^{133}Cs	1.294
^{237}Np	1.169
^{131}Xe	1.148
other	14.063

Table 52: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 2.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.53 60 GWd, 3% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	36.382
^{239}Pu	14.603
^{240}Pu	13.369
^{241}Pu	4.419
^{143}Nd	2.949
^{149}Sm	2.007
^{151}Sm	1.536
^{242}Pu	1.450
^{238}Pu	1.433
^{133}Cs	1.426
^{131}Xe	1.288
^{235}U	1.233
^{237}Np	1.215
^{99}Tc	1.078
other	15.612

Table 53: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 3.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.54 60 GWd, 3% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	35.502
^{239}Pu	14.239
^{240}Pu	13.168
^{241}Pu	3.559
^{155}Gd	3.355
^{143}Nd	2.874
^{241}Am	2.393
^{149}Sm	1.967
^{151}Sm	1.441
^{242}Pu	1.427
^{133}Cs	1.402
^{238}Pu	1.374
^{131}Xe	1.251
^{235}U	1.205
^{237}Np	1.190
^{99}Tc	1.063
other	12.589

Table 54: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 3.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.55 60 GWd, 3% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	34.138
^{239}Pu	13.707
^{240}Pu	13.032
^{241}Am	6.048
^{155}Gd	5.823
^{143}Nd	2.771
^{149}Sm	1.895
^{241}Pu	1.660
^{242}Pu	1.360
^{133}Cs	1.347
^{151}Sm	1.234
^{131}Xe	1.204
^{238}Pu	1.181
^{237}Np	1.171
^{235}U	1.164
^{99}Tc	1.019
other	11.247

Table 55: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 3.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.56 60 GWd, 3% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	33.536
^{239}Pu	13.553
^{240}Pu	13.230
^{241}Am	8.595
^{155}Gd	6.189
^{143}Nd	2.769
^{149}Sm	1.900
^{237}Np	1.380
^{242}Pu	1.329
^{133}Cs	1.323
^{131}Xe	1.191
^{235}U	1.166
other	13.838

Table 56: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 3.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.57 60 GWd, 4% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	35.763
^{239}Pu	14.736
^{240}Pu	12.836
^{241}Pu	4.212
^{143}Nd	3.187
^{235}U	2.611
^{149}Sm	2.050
^{151}Sm	1.534
^{133}Cs	1.455
^{238}Pu	1.369
^{237}Np	1.354
^{131}Xe	1.310
^{242}Pu	1.262
^{236}U	1.210
^{99}Tc	1.096
other	14.016

Table 57: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 4.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.58 60 GWd, 4% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	34.993
^{239}Pu	14.401
^{240}Pu	12.650
^{241}Pu	3.397
^{143}Nd	3.119
^{155}Gd	3.023
^{235}U	2.554
^{241}Am	2.369
^{149}Sm	2.001
^{151}Sm	1.454
^{133}Cs	1.421
^{237}Np	1.335
^{238}Pu	1.319
^{131}Xe	1.278
^{242}Pu	1.229
^{236}U	1.205
^{99}Tc	1.080
other	11.172

Table 58: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 4.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.59 60 GWd, 4% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	33.719
^{239}Pu	13.901
^{240}Pu	12.417
^{241}Am	5.953
^{155}Gd	5.277
^{143}Nd	3.018
^{235}U	2.476
^{149}Sm	1.943
^{241}Pu	1.594
^{133}Cs	1.384
^{237}Np	1.310
^{151}Sm	1.252
^{131}Xe	1.240
^{242}Pu	1.186
^{236}U	1.161
^{238}Pu	1.136
^{99}Tc	1.048
other	9.984

Table 59: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 4.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.60 60 GWd, 4% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	33.164
^{239}Pu	13.789
^{240}Pu	12.495
^{241}Am	8.418
^{155}Gd	5.605
^{143}Nd	3.028
^{235}U	2.472
^{149}Sm	1.947
^{237}Np	1.536
^{133}Cs	1.352
^{131}Xe	1.223
^{242}Pu	1.165
^{236}U	1.140
^{99}Tc	1.023
other	11.644

Table 60: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 4.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.1.61 60 GWd, 5% Initial Enrichment, 1 year Cooled

Isotope	captures (% of total)
^{238}U	34.324
^{239}Pu	14.938
^{240}Pu	12.528
^{235}U	4.605
^{241}Pu	4.090
^{143}Nd	3.277
^{149}Sm	2.089
^{151}Sm	1.551
^{133}Cs	1.487
^{236}U	1.424
^{237}Np	1.384
^{131}Xe	1.350
^{238}Pu	1.191
^{242}Pu	1.146
^{99}Tc	1.120
other	13.496

Table 61: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 5.0% IE, 1.0 yr, PNAR. captures in ^{1}H are not included.

1.1.62 60 GWd, 5% Initial Enrichment, 5 year Cooled

Isotope	captures (% of total)
^{238}U	33.663
^{239}Pu	14.640
^{240}Pu	12.337
^{235}U	4.513
^{241}Pu	3.313
^{143}Nd	3.205
^{155}Gd	2.601
^{241}Am	2.450
^{149}Sm	2.053
^{151}Sm	1.466
^{133}Cs	1.457
^{236}U	1.424
^{237}Np	1.356
^{131}Xe	1.319
^{238}Pu	1.147
^{242}Pu	1.122
^{99}Tc	1.103
other	10.832

Table 62: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 5.0% IE, 5.0 yr, PNAR. captures in ^{1}H are not included.

1.1.63 60 GWd, 5% Initial Enrichment, 20 year Cooled

Isotope	captures (% of total)
^{238}U	32.522
^{239}Pu	14.171
^{240}Pu	12.069
^{241}Am	6.068
^{155}Gd	4.554
^{235}U	4.381
^{143}Nd	3.118
^{149}Sm	1.999
^{241}Pu	1.560
^{133}Cs	1.411
^{236}U	1.381
^{237}Np	1.347
^{131}Xe	1.270
^{151}Sm	1.269
^{242}Pu	1.073
^{99}Tc	1.071
other	10.736

Table 63: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 5.0% IE, 20.0 yr, PNAR. captures in ^{1}H are not included.

1.1.64 60 GWd, 5% Initial Enrichment, 80 year Cooled

Isotope	captures (% of total)
^{238}U	32.050
^{239}Pu	14.040
^{240}Pu	12.024
^{241}Am	8.565
^{155}Gd	4.818
^{235}U	4.371
^{143}Nd	3.112
^{149}Sm	2.002
^{237}Np	1.571
^{133}Cs	1.389
^{236}U	1.351
^{131}Xe	1.255
^{242}Pu	1.051
^{99}Tc	1.046
other	11.353

Table 64: Isotopes that capture more than 1% of all the captures in assembly H2O, 60.0 GWd, 5.0% IE, 80.0 yr, PNAR. captures in ^{1}H are not included.

1.2 Fissions by Isotope

1.2.1 15 GWd, 2.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	43.665
^{235}U	41.062
^{241}Pu	8.116
^{238}U	7.034
other	0.123

Table 65: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 2.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.2 15 GWd, 2.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	44.281
^{235}U	41.667
^{238}U	7.151
^{241}Pu	6.762
other	0.139

Table 66: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 2.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.3 15 GWd, 2.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	45.840
^{235}U	43.235
^{238}U	7.350
^{241}Pu	3.403
other	0.172

Table 67: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 2.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.4 15 GWd, 2.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	47.360
^{235}U	44.841
^{238}U	7.411
other	0.388

Table 68: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 2.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.5 15 GWd, 3.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{235}U	55.787
^{239}Pu	33.135
^{238}U	6.288
^{241}Pu	4.690
other	0.101

Table 69: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 3.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.6 15 GWd, 3.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{235}U	56.283
^{239}Pu	33.385
^{238}U	6.334
^{241}Pu	3.890
other	0.108

Table 70: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 3.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.7 15 GWd, 3.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{235}U	57.445
^{239}Pu	34.070
^{238}U	6.431
^{241}Pu	1.927
other	0.127

Table 71: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 3.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.8 15 GWd, 3.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{235}U	58.705
^{239}Pu	34.625
^{238}U	6.421
other	0.248

Table 72: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 3.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.9 15 GWd, 4.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{235}U	64.895
^{239}Pu	26.279
^{238}U	5.816
^{241}Pu	2.923
other	0.087

Table 73: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 4.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.10 15 GWd, 4.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{235}U	65.218
^{239}Pu	26.418
^{238}U	5.845
^{241}Pu	2.427
other	0.092

Table 74: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 4.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.11 15 GWd, 4.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{235}U	66.095
^{239}Pu	26.728
^{238}U	5.887
^{241}Pu	1.185
other	0.105

Table 75: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 4.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.12 15 GWd, 4.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{235}U	66.939
^{239}Pu	27.004
^{238}U	5.877
other	0.180

Table 76: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 4.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.13 15 GWd, 5.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{235}U	70.767
^{239}Pu	21.680
^{238}U	5.501
^{241}Pu	1.975
other	0.077

Table 77: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 5.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.14 15 GWd, 5.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{235}U	71.029
^{239}Pu	21.734
^{238}U	5.519
^{241}Pu	1.637
other	0.081

Table 78: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 5.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.15 15 GWd, 5.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{235}U	71.649
^{239}Pu	21.924
^{238}U	5.535
other	0.891

Table 79: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 5.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.16 15 GWd, 5.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{235}U	72.317
^{239}Pu	22.032
^{238}U	5.507
other	0.144

Table 80: Isotopes that fission more than 1% of all the fissions in assembly H2O, 15.0 GWd, 5.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.17 30 GWd, 2.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	54.984
^{235}U	19.019
^{241}Pu	17.944
^{238}U	7.659
other	0.394

Table 81: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 2.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.18 30 GWd, 2.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	56.720
^{235}U	19.631
^{241}Pu	15.266
^{238}U	7.947
other	0.435

Table 82: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 2.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.19 30 GWd, 2.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	61.502
^{235}U	21.354
^{238}U	8.539
^{241}Pu	8.064
other	0.541

Table 83: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 2.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.20 30 GWd, 2.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	66.568
^{235}U	23.302
^{238}U	9.040
other	1.090

Table 84: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 2.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.21 30 GWd, 3.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	45.998
^{235}U	33.766
^{241}Pu	13.028
^{238}U	6.921
other	0.285

Table 85: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 3.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.22 30 GWd, 3.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	47.056
^{235}U	34.570
^{241}Pu	10.992
^{238}U	7.070
other	0.312

Table 86: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 3.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.23 30 GWd, 3.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	49.827
^{235}U	36.692
^{238}U	7.440
^{241}Pu	5.665
other	0.377

Table 87: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 3.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.24 30 GWd, 3.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	52.587
^{235}U	38.931
^{238}U	7.726
other	0.756

Table 88: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 3.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.25 30 GWd, 4.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{235}U	45.515
^{239}Pu	38.551
^{241}Pu	9.362
^{238}U	6.342
other	0.230

Table 89: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 4.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.26 30 GWd, 4.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{235}U	46.315
^{239}Pu	39.128
^{241}Pu	7.860
^{238}U	6.449
other	0.248

Table 90: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 4.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.27 30 GWd, 4.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{235}U	48.302
^{239}Pu	40.773
^{238}U	6.660
^{241}Pu	3.967
other	0.298

Table 91: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 4.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.28 30 GWd, 4.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{235}U	50.366
^{239}Pu	42.263
^{238}U	6.822
other	0.550

Table 92: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 4.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.29 30 GWd, 5.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{235}U	54.094
^{239}Pu	32.898
^{241}Pu	6.887
^{238}U	5.921
other	0.201

Table 93: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 5.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.30 30 GWd, 5.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{235}U	54.759
^{239}Pu	33.281
^{238}U	5.983
^{241}Pu	5.763
other	0.213

Table 94: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 5.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.31 30 GWd, 5.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{235}U	56.500
^{239}Pu	34.241
^{238}U	6.135
^{241}Pu	2.872
other	0.252

Table 95: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 5.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.32 30 GWd, 5.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{235}U	58.218
^{239}Pu	35.109
^{238}U	6.236
other	0.438

Table 96: Isotopes that fission more than 1% of all the fissions in assembly H2O, 30.0 GWd, 5.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.33 45 GWd, 2.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	59.496
^{241}Pu	23.326
^{238}U	8.112
^{235}U	7.974
other	1.091

Table 97: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 2.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.34 45 GWd, 2.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	61.988
^{241}Pu	20.054
^{238}U	8.470
^{235}U	8.326
other	1.161

Table 98: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 2.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.35 45 GWd, 2.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	69.091
^{241}Pu	10.846
^{238}U	9.361
^{235}U	9.335
other	1.366

Table 99: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 2.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.36 45 GWd, 2.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	77.061
^{235}U	10.492
^{238}U	10.243
other	2.204

Table 100: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 2.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.37 45 GWd, 3.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	53.629
^{241}Pu	19.823
^{235}U	18.265
^{238}U	7.553
other	0.730

Table 101: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 3.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.38 45 GWd, 3.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	55.558
^{235}U	18.940
^{241}Pu	16.899
^{238}U	7.810
other	0.793

Table 102: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 3.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.39 45 GWd, 3.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	60.811
^{235}U	20.798
^{241}Pu	8.968
^{238}U	8.500
other	0.923

Table 103: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 3.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.40 45 GWd, 3.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	66.406
^{235}U	22.898
^{238}U	9.111
other	1.585

Table 104: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 3.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.41 45 GWd, 4.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	46.890
^{235}U	29.828
^{241}Pu	15.822
^{238}U	6.937
other	0.523

Table 105: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 4.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.42 45 GWd, 4.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	48.251
^{235}U	30.665
^{241}Pu	13.415
^{238}U	7.110
other	0.560

Table 106: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 4.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.43 45 GWd, 4.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	51.746
^{235}U	33.000
^{238}U	7.600
^{241}Pu	6.993
other	0.661

Table 107: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 4.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.44 45 GWd, 4.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	55.396
^{235}U	35.523
^{238}U	7.933
other	1.148

Table 108: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 4.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.45 45 GWd, 5.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	40.999
^{235}U	39.743
^{241}Pu	12.479
^{238}U	6.369
other	0.410

Table 109: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 5.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.46 45 GWd, 5.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	41.927
^{235}U	40.607
^{241}Pu	10.514
^{238}U	6.506
other	0.446

Table 110: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 5.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.47 45 GWd, 5.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	44.189
^{235}U	43.021
^{238}U	6.877
^{241}Pu	5.396
other	0.518

Table 111: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 5.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.48 45 GWd, 5.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	46.453
^{235}U	45.545
^{238}U	7.120
other	0.882

Table 112: Isotopes that fission more than 1% of all the fissions in assembly H2O, 45.0 GWd, 5.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.49 60 GWd, 2.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	60.896
^{241}Pu	25.443
^{238}U	8.271
^{235}U	3.179
^{245}Cm	1.586
other	0.624

Table 113: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 2.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.50 60 GWd, 2.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	63.759
^{241}Pu	21.891
^{238}U	8.667
^{235}U	3.330
^{245}Cm	1.663
other	0.690

Table 114: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 2.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.51 60 GWd, 2.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	71.803
^{241}Pu	12.000
^{238}U	9.708
^{235}U	3.775
^{245}Cm	1.879
other	0.836

Table 115: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 2.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.52 60 GWd, 2.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	81.046
^{238}U	10.784
^{235}U	4.338
^{245}Cm	2.122
other	1.709

Table 116: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 2.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.53 60 GWd, 3.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	57.665
^{241}Pu	23.817
^{235}U	8.943
^{238}U	7.931
^{245}Cm	1.023
other	0.621

Table 117: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 3.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.54 60 GWd, 3.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	60.123
^{241}Pu	20.477
^{235}U	9.338
^{238}U	8.317
^{245}Cm	1.074
other	0.671

Table 118: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 3.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.55 60 GWd, 3.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	67.227
^{241}Pu	11.088
^{235}U	10.451
^{238}U	9.217
^{245}Cm	1.192
other	0.825

Table 119: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 3.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.56 60 GWd, 3.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	75.125
^{235}U	11.851
^{238}U	10.099
^{245}Cm	1.319
other	1.605

Table 120: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 3.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.57 60 GWd, 4.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	53.190
^{241}Pu	20.958
^{235}U	17.223
^{238}U	7.461
other	1.167

Table 121: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 4.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.58 60 GWd, 4.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	55.200
^{241}Pu	17.908
^{235}U	17.903
^{238}U	7.751
other	1.238

Table 122: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 4.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.59 60 GWd, 4.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	60.720
^{235}U	19.761
^{241}Pu	9.580
^{238}U	8.508
other	1.432

Table 123: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 4.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.60 60 GWd, 4.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	66.804
^{235}U	21.893
^{238}U	9.137
other	2.166

Table 124: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 4.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.61 60 GWd, 5.0% Initial Enrichment, 1.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	47.452
^{235}U	26.608
^{241}Pu	18.181
^{238}U	6.863
other	0.895

Table 125: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 5.0% IE, 1.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.62 60 GWd, 5.0% Initial Enrichment, 5.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	49.003
^{235}U	27.405
^{241}Pu	15.526
^{238}U	7.110
other	0.955

Table 126: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 5.0% IE, 5.0 yr, PNAR. fissions in ^{1}H are not included.

1.2.63 60 GWd, 5.0% Initial Enrichment, 20.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	53.198
^{235}U	29.851
^{241}Pu	8.194
^{238}U	7.653
other	1.104

Table 127: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 5.0% IE, 20.0 yr, PNAR. fissions in ^{1}H are not included.

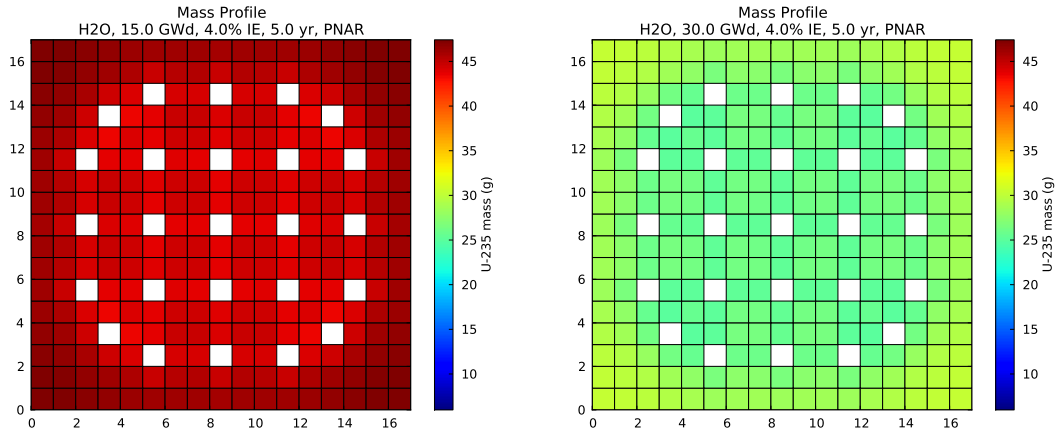
1.2.64 60 GWd, 5.0% Initial Enrichment, 80.0 year Cooled

Isotope	fissions (% of total)
^{239}Pu	57.647
^{235}U	32.538
^{238}U	8.130
other	1.685

Table 128: Isotopes that fission more than 1% of all the fissions in assembly H2O, 60.0 GWd, 5.0% IE, 80.0 yr, PNAR. fissions in ^{1}H are not included.

2 Mass Changes with Burnup

2.1 U-235



(a) 15 GWd (b) 30 GWd

(c) 45 GWd (d) 60 GWd

Figure 1: Change in mass of ^{235}U with an increase in Burnup.

Figure 1 shows the change in the mass of ^{235}U for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{235}U (1.192×10^4 g) occurs when Burnup is 15 GWd, and the smallest mass (1946 g) occurs when Burnup is 60 GWd; the overall change in mass is 83.67 %. The change in the mass of ^{235}U in the individual assemblies is given in Table 129.

Parameter	min (location)	max (location)	% diff
15	43.5252 (4, -5, 0)	47.4204 (-8, -8, 0)	8.21
30	24.9570 (4, -5, 0)	30.3676 (-8, -8, 0)	17.82
45	12.9773 (4, -5, 0)	18.2247 (-8, -8, 0)	28.79
60	5.9772 (4, -5, 0)	10.0405 (-8, -8, 0)	40.47

Table 129: The change in the mass of ^{235}U for each assembly shown in Figure 1. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{235}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

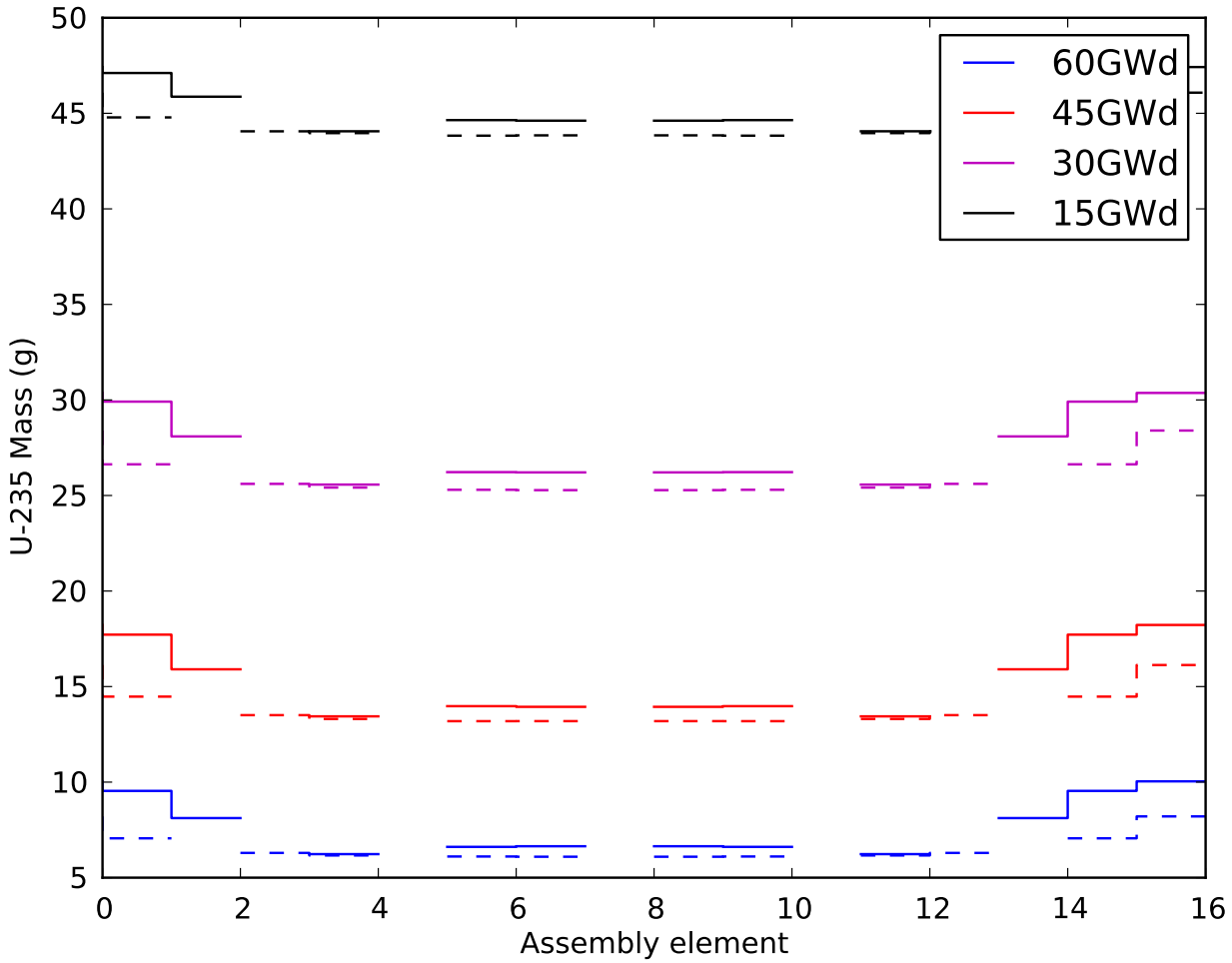
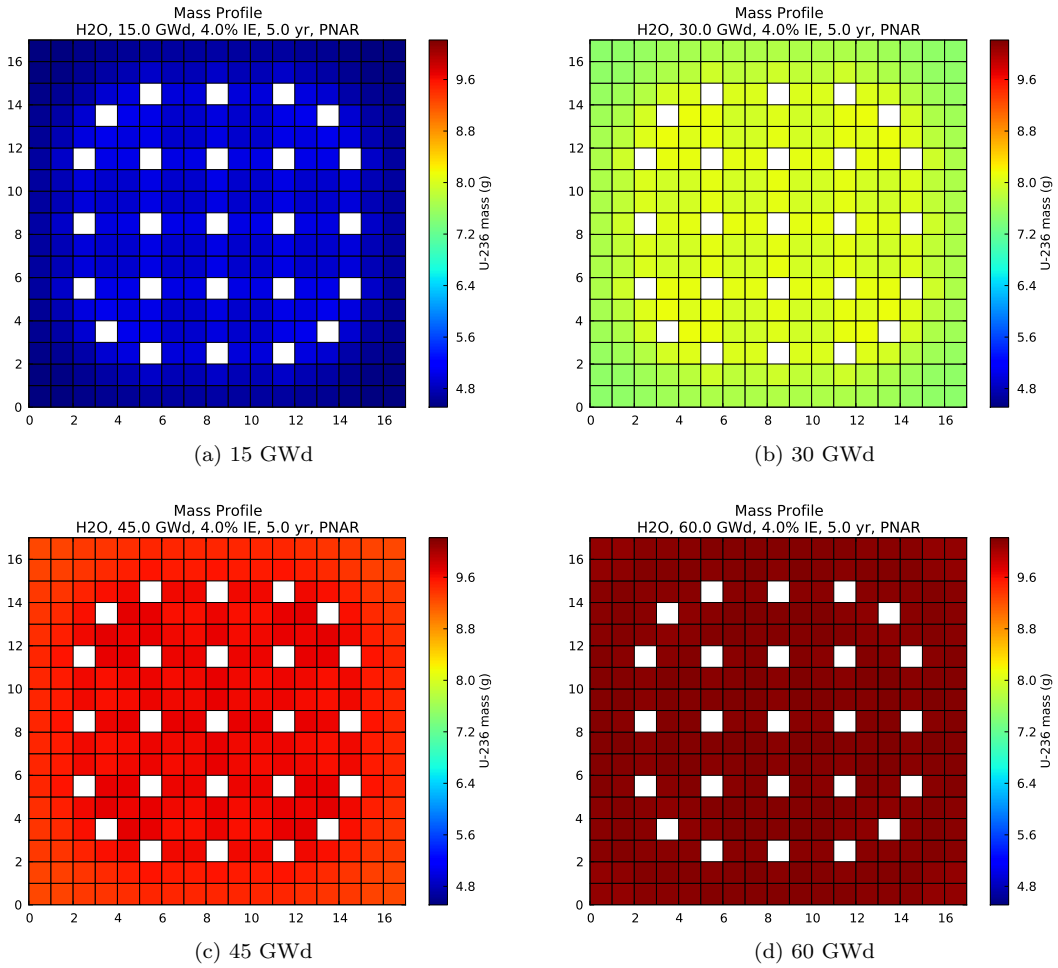


Figure 2: ^{235}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.2 U-236



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 3: Change in mass of ^{236}U with an increase in Burnup.

Figure 3 shows the change in the mass of ^{236}U for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{236}U (2686 g) occurs when Burnup is 60 GWd, and the smallest mass (1276 g) occurs when Burnup is 15 GWd; the overall change in mass is 52.48 %. The change in the mass of ^{236}U in the individual assemblies is given in Table 130.

Parameter	min (location)	max (location)	% diff
15	4.5115 (-8, -8, 0)	5.0649 (4, -5, 0)	10.93
30	7.4890 (-8, -8, 0)	8.1348 (4, -5, 0)	7.94
45	9.2739 (-8, -8, 0)	9.7063 (4, -5, 0)	4.45
60	10.1182 (-8, -8, 0)	10.2145 (-1, 7, 0)	0.94

Table 130: The change in the mass of ^{236}U for each assembly shown in Figure 3. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{236}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

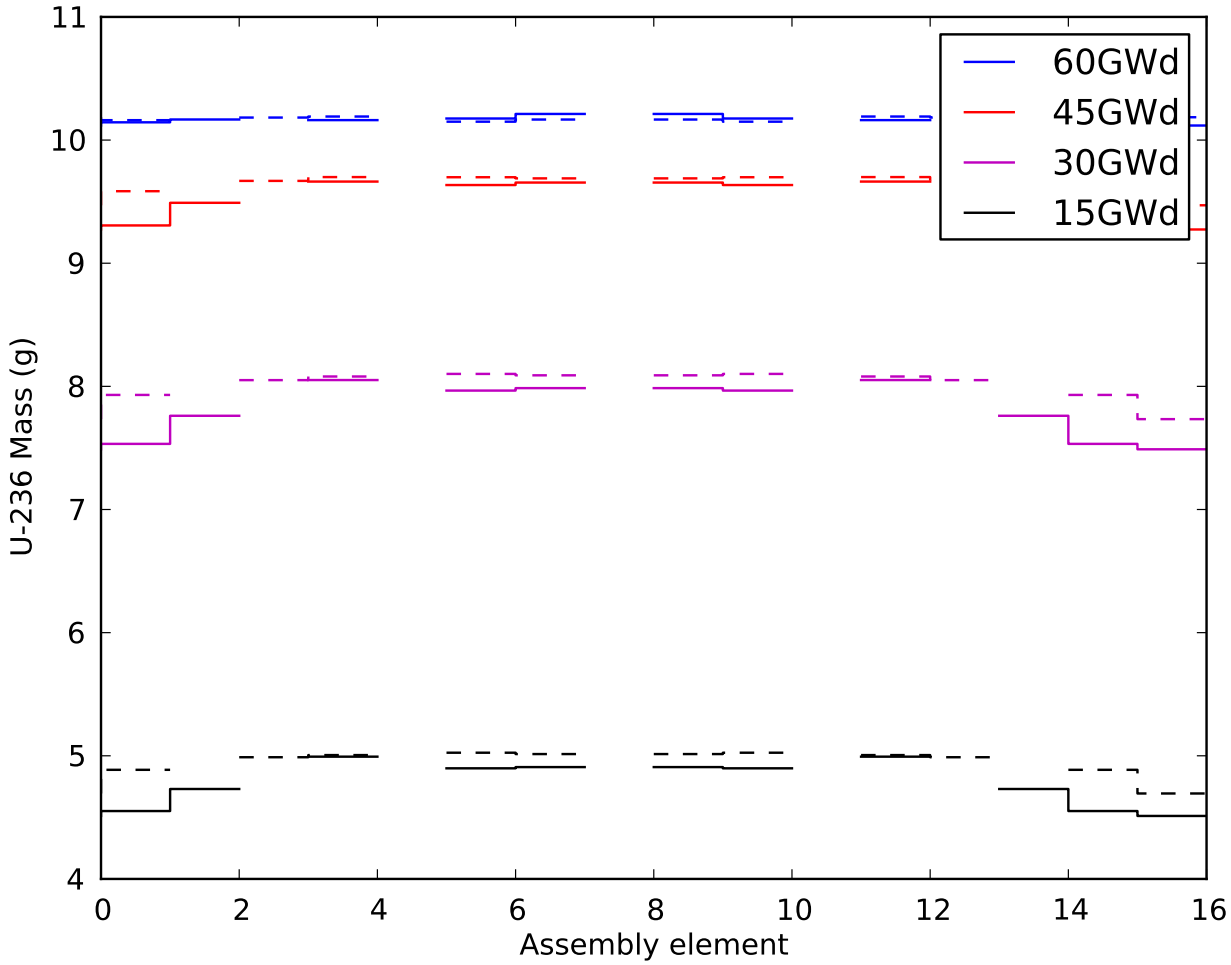
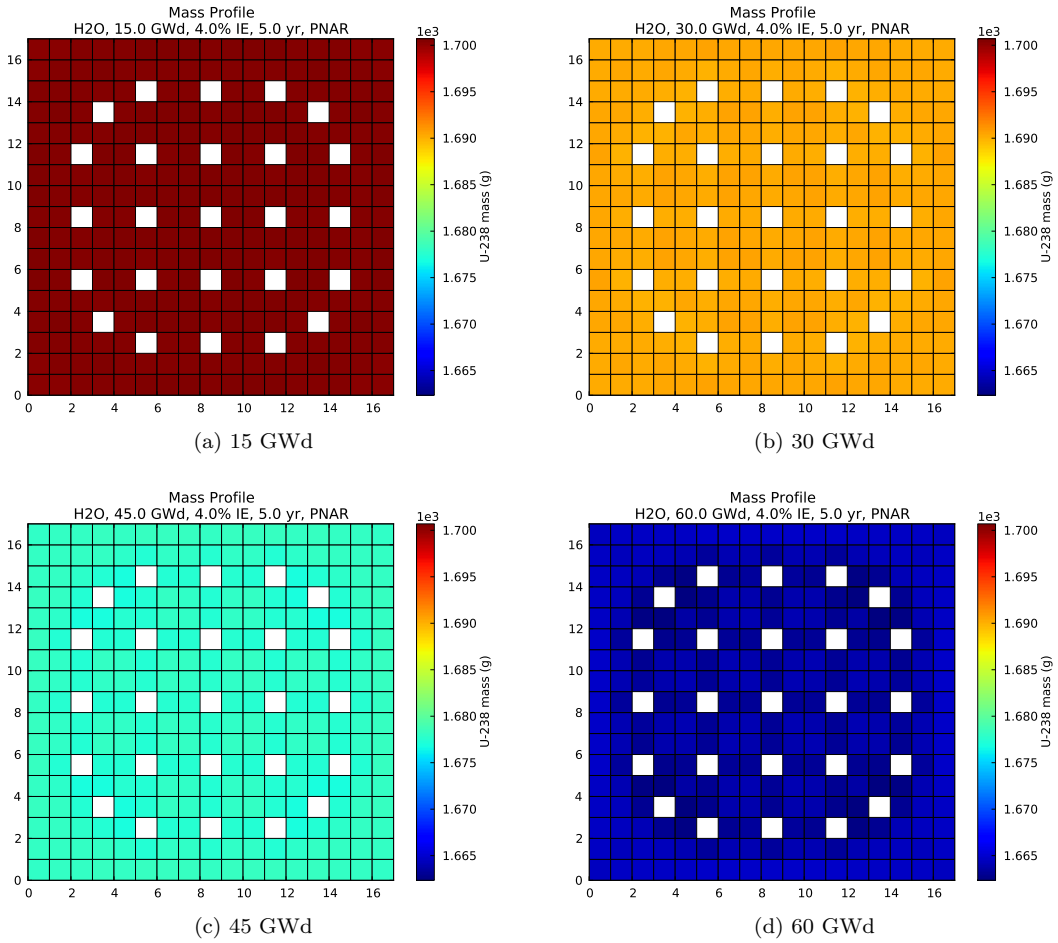


Figure 4: ^{236}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.3 U-238



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 5: Change in mass of ^{238}U with an increase in Burnup.

Figure 5 shows the change in the mass of ^{238}U for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{238}U (4.489×10^5 g) occurs when Burnup is 15 GWd, and the smallest mass (4.393×10^5 g) occurs when Burnup is 60 GWd; the overall change in mass is 2.16 %. The change in the mass of ^{238}U in the individual assemblies is given in Table 131.

Parameter	min (location)	max (location)	% diff
15	1700.3380 (-8, -8, 0)	1700.6948 (2, -2, 0)	0.02
30	1689.9166 (-4, 6, 0)	1690.5791 (2, 5, 0)	0.04
45	1676.9486 (-4, 6, 0)	1678.3526 (8, 3, 0)	0.08
60	1662.3464 (4, -5, 0)	1664.7999 (-8, -1, 0)	0.15

Table 131: The change in the mass of ^{238}U for each assembly shown in Figure 5. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{238}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

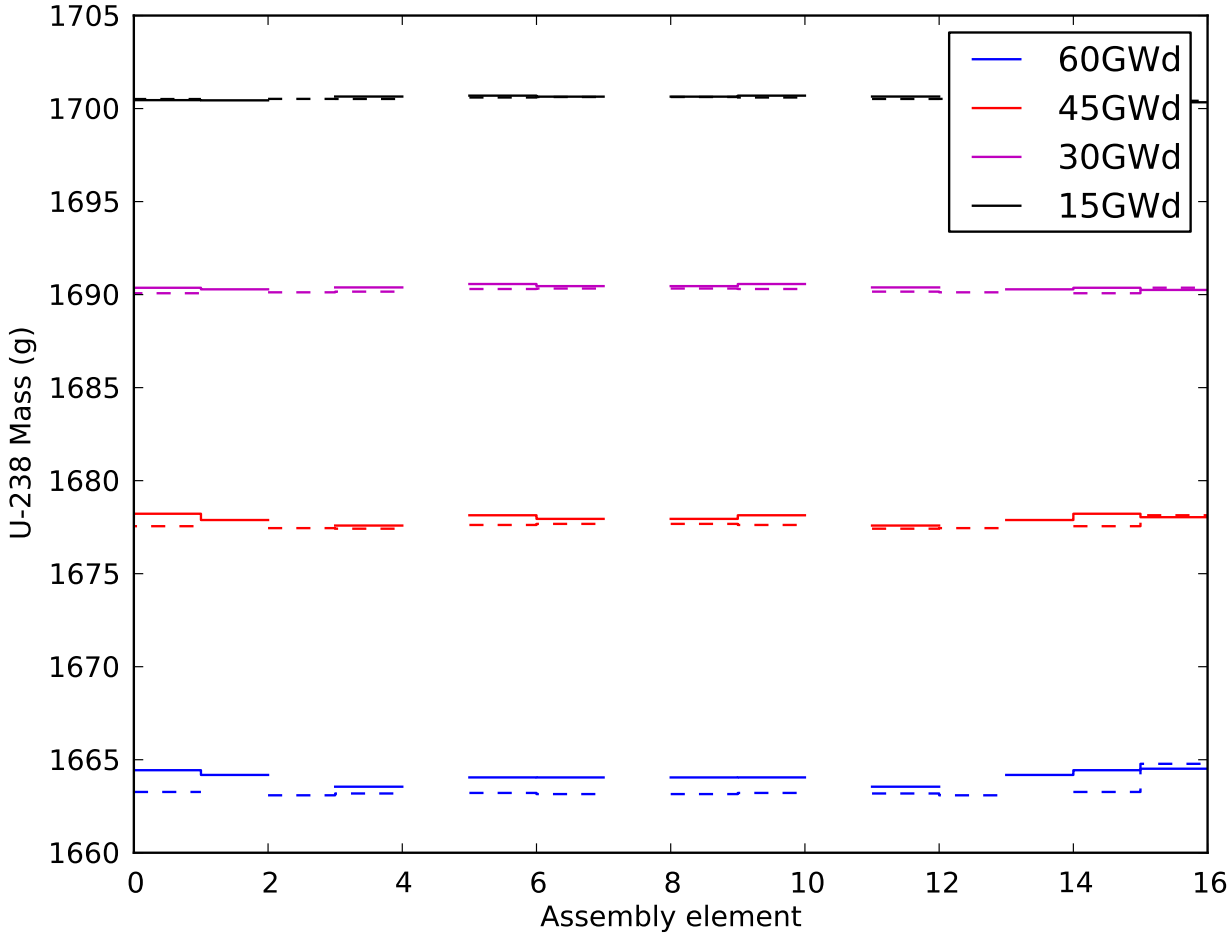
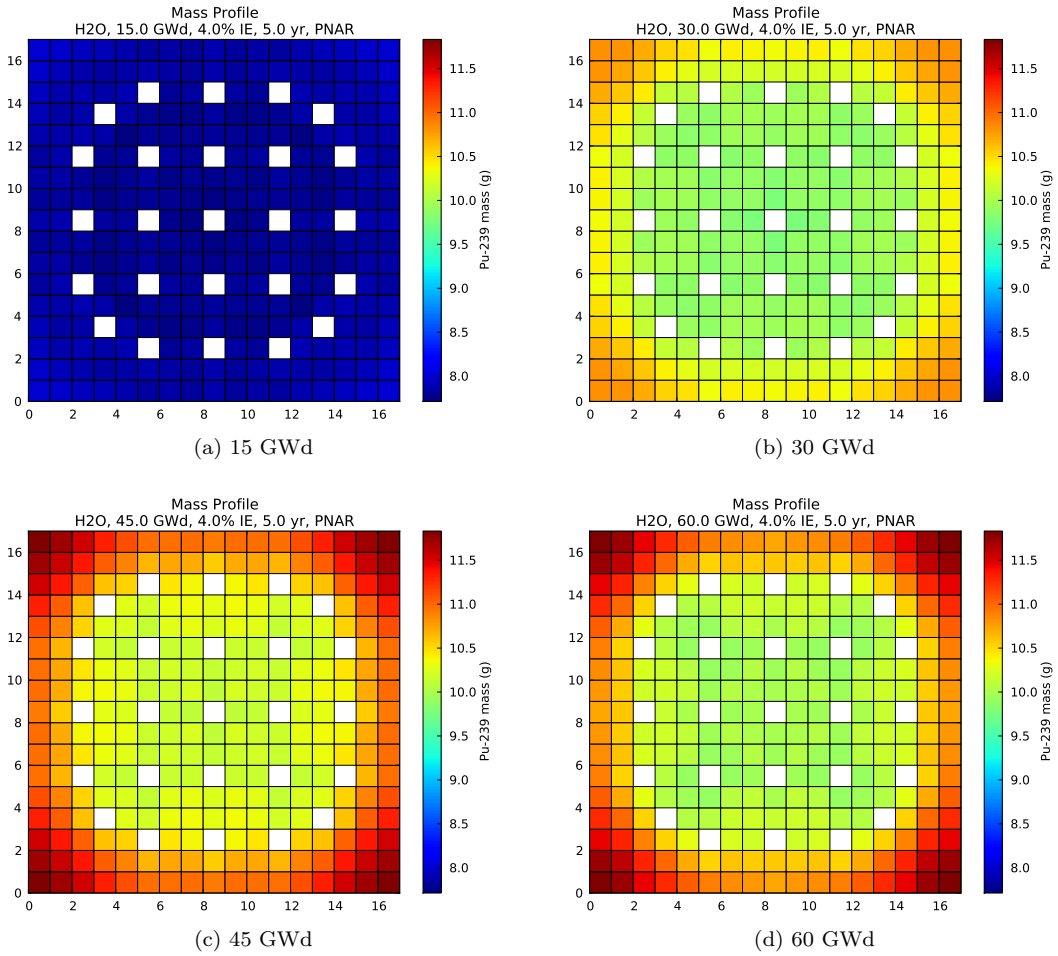


Figure 6: ^{238}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.4 Pu-239



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 7: Change in mass of ^{239}Pu with an increase in Burnup.

Figure 7 shows the change in the mass of ^{239}Pu for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{239}Pu (2817 g) occurs when Burnup is 45 GWd, and the smallest mass (2070 g) occurs when Burnup is 15 GWd; the overall change in mass is 26.53 %. The change in the mass of ^{239}Pu in the individual assemblies is given in Table 132.

Parameter	min (location)	max (location)	% diff
15	7.7123 (-4, -4, 0)	8.0026 (-8, -8, 0)	3.63
30	9.7799 (-1, 0, 0)	10.8210 (-8, -8, 0)	9.62
45	10.1068 (-1, 0, 0)	11.8325 (-8, -8, 0)	14.58
60	9.9099 (4, -3, 0)	11.8267 (-8, -8, 0)	16.21

Table 132: The change in the mass of ^{239}Pu for each assembly shown in Figure 7. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{239}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

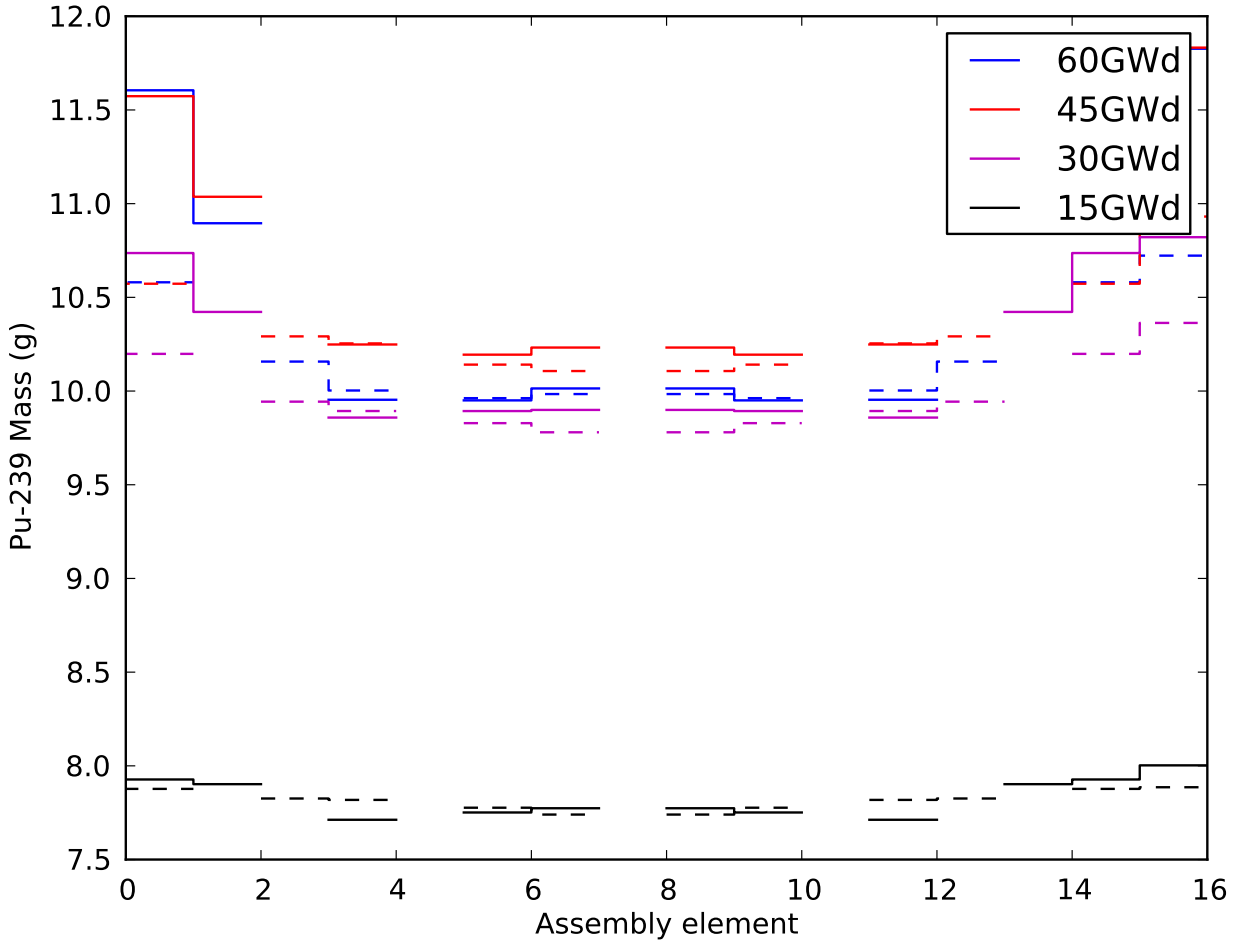
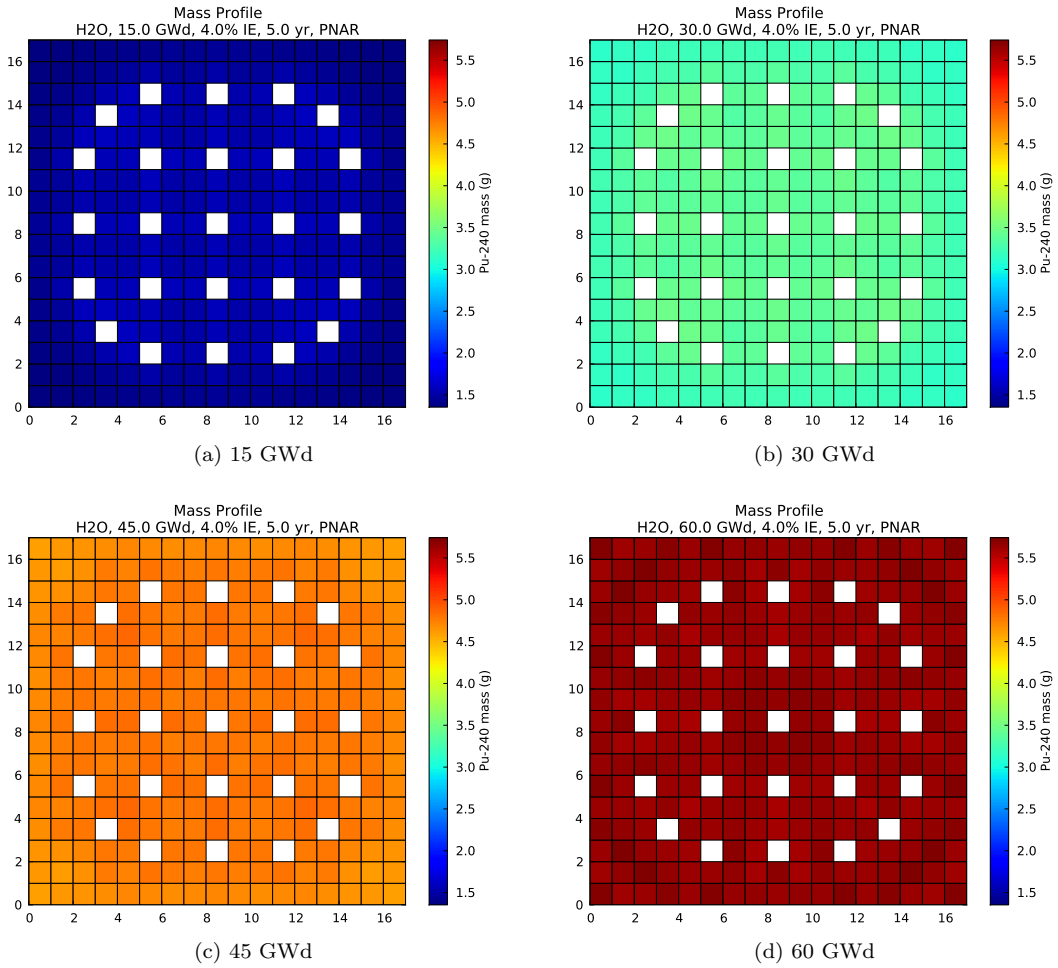


Figure 8: ^{239}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.5 Pu-240



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 9: Change in mass of ^{240}Pu with an increase in Burnup.

Figure 9 shows the change in the mass of ^{240}Pu for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{240}Pu (1491 g) occurs when Burnup is 60 GWd, and the smallest mass (393.6 g) occurs when Burnup is 15 GWd; the overall change in mass is 73.60 %. The change in the mass of ^{240}Pu in the individual assemblies is given in Table 133.

Parameter	min (location)	max (location)	% diff
15	1.3527 (-7, -8, 0)	1.5989 (4, -5, 0)	15.40
30	3.1242 (-8, -8, 0)	3.4693 (4, -5, 0)	9.95
45	4.6099 (-8, -8, 0)	4.8541 (-4, -4, 0)	5.03
60	5.5748 (-4, -4, 0)	5.7426 (6, 7, 0)	2.92

Table 133: The change in the mass of ^{240}Pu for each assembly shown in Figure 9. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{240}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

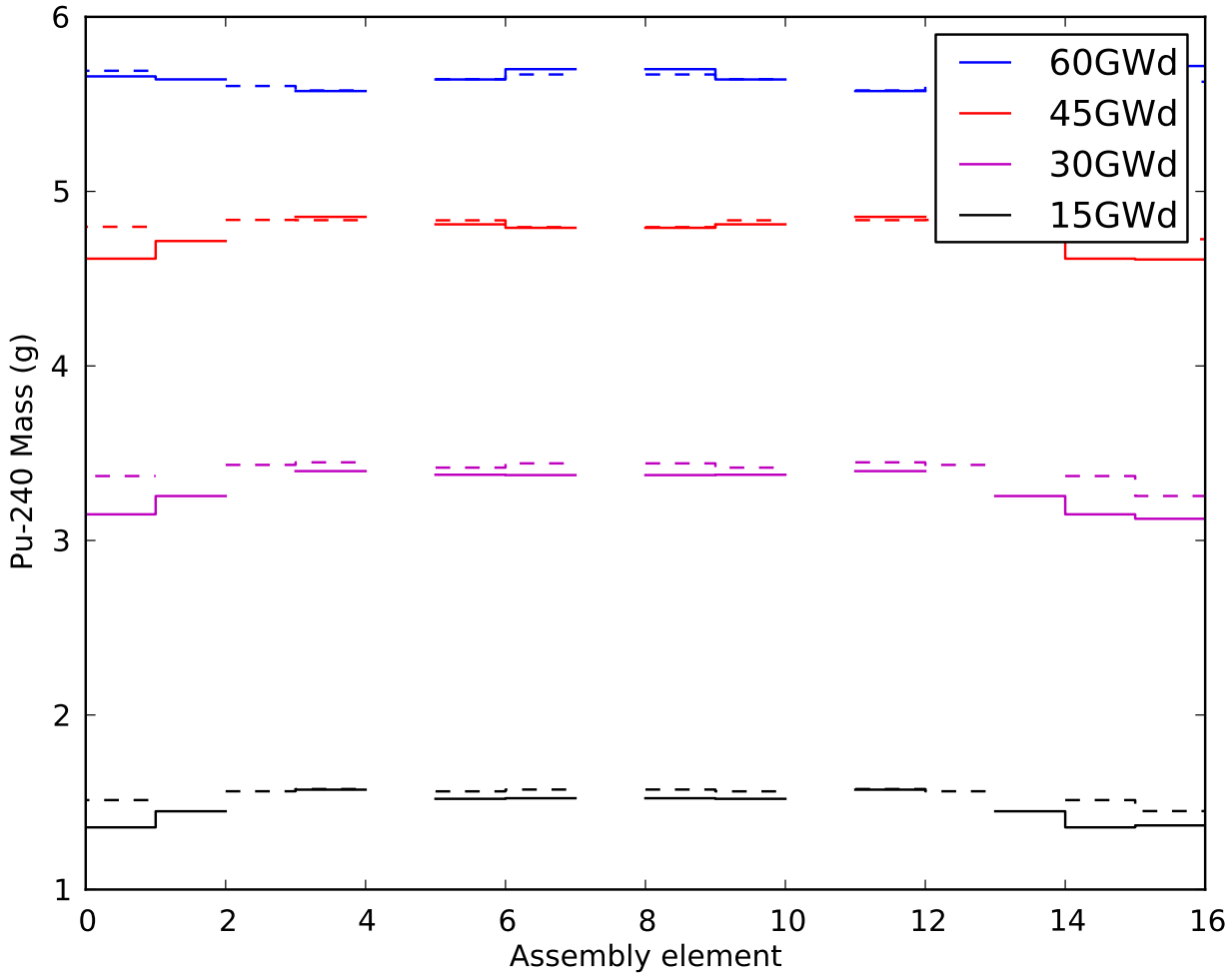
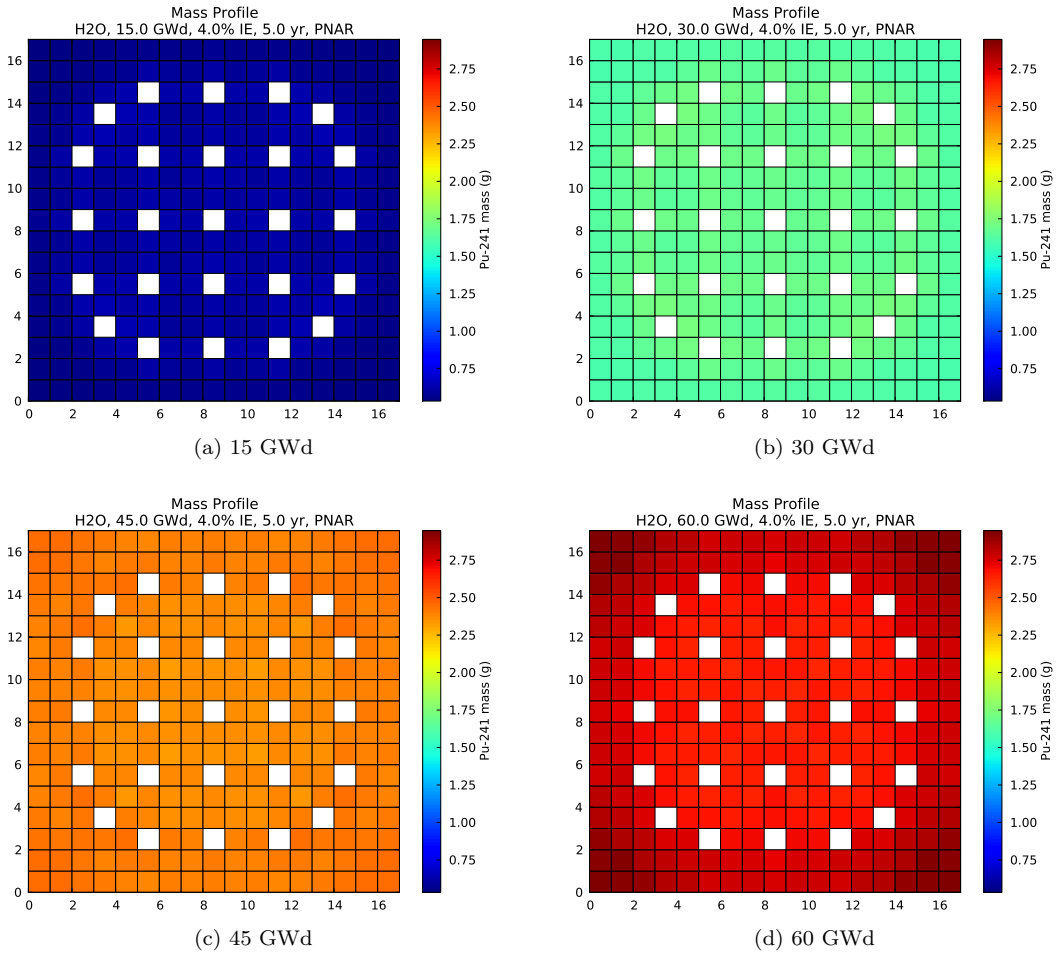


Figure 10: ^{240}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.6 Pu-241



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 11: Change in mass of ^{241}Pu with an increase in Burnup.

Figure 11 shows the change in the mass of ^{241}Pu for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{241}Pu (724 g) occurs when Burnup is 60 GWd, and the smallest mass (157.3 g) occurs when Burnup is 15 GWd; the overall change in mass is 78.27 %. The change in the mass of ^{241}Pu in the individual assemblies is given in Table 134.

Parameter	min (location)	max (location)	% diff
15	0.5339 (-8, -8, 0)	0.6382 (4, -5, 0)	16.34
30	1.5943 (-7, -8, 0)	1.7229 (4, -5, 0)	7.46
45	2.3325 (2, -2, 0)	2.4523 (-7, -8, 0)	4.88
60	2.6297 (2, -2, 0)	2.9471 (-8, -8, 0)	10.77

Table 134: The change in the mass of ^{241}Pu for each assembly shown in Figure 11. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

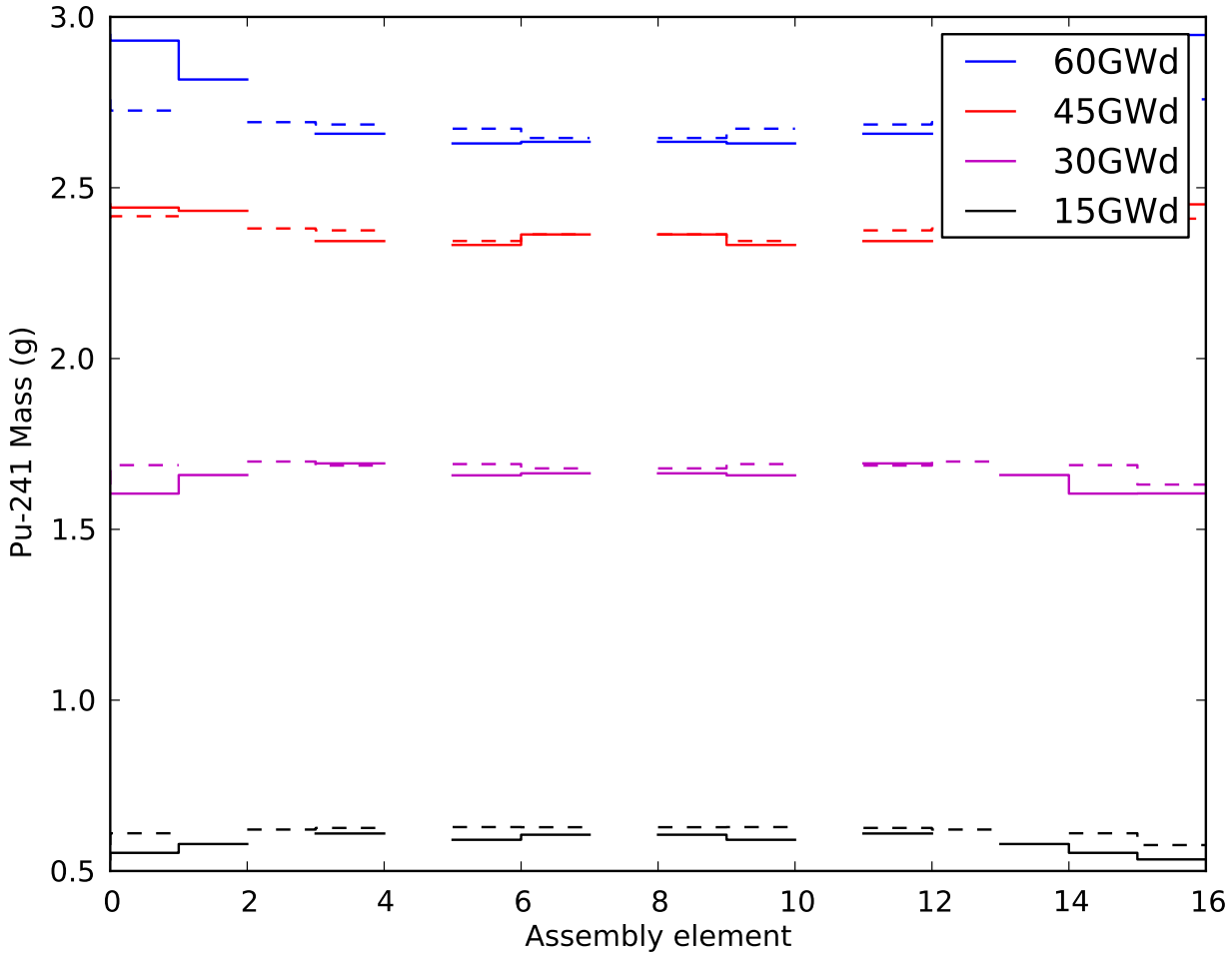
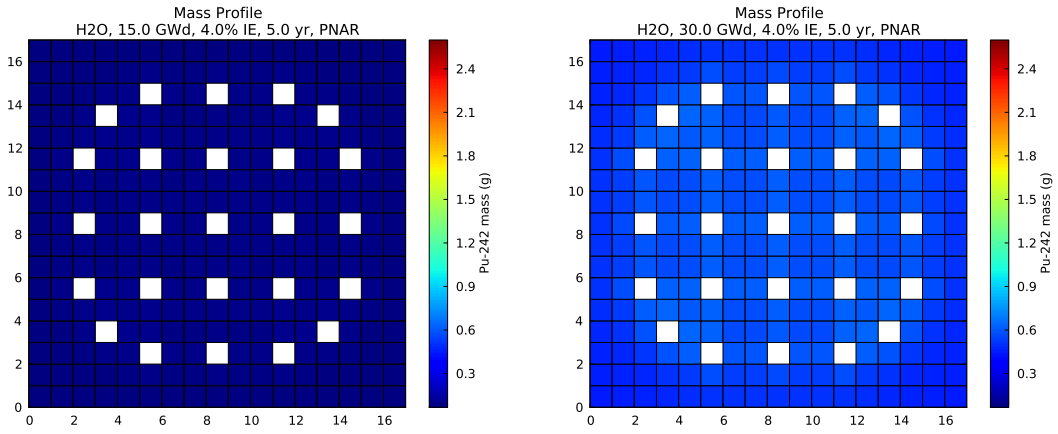


Figure 12: ^{241}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.7 Pu-242



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 13: Change in mass of ^{242}Pu with an increase in Burnup.

Figure 13 shows the change in the mass of ^{242}Pu for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{242}Pu (628.2 g) occurs when Burnup is 60 GWd, and the smallest mass (22.39 g) occurs when Burnup is 15 GWd; the overall change in mass is 96.44 %. The change in the mass of ^{242}Pu in the individual assemblies is given in Table 135.

Parameter	min (location)	max (location)	% diff
15	0.0673 (-8, -8, 0)	0.0986 (4, -5, 0)	31.67
30	0.4529 (-8, -8, 0)	0.6361 (4, -5, 0)	28.80
45	1.1549 (-8, -8, 0)	1.5452 (4, -5, 0)	25.26
60	2.0441 (-8, -8, 0)	2.5987 (4, -5, 0)	21.34

Table 135: The change in the mass of ^{242}Pu for each assembly shown in Figure 13. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{242}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

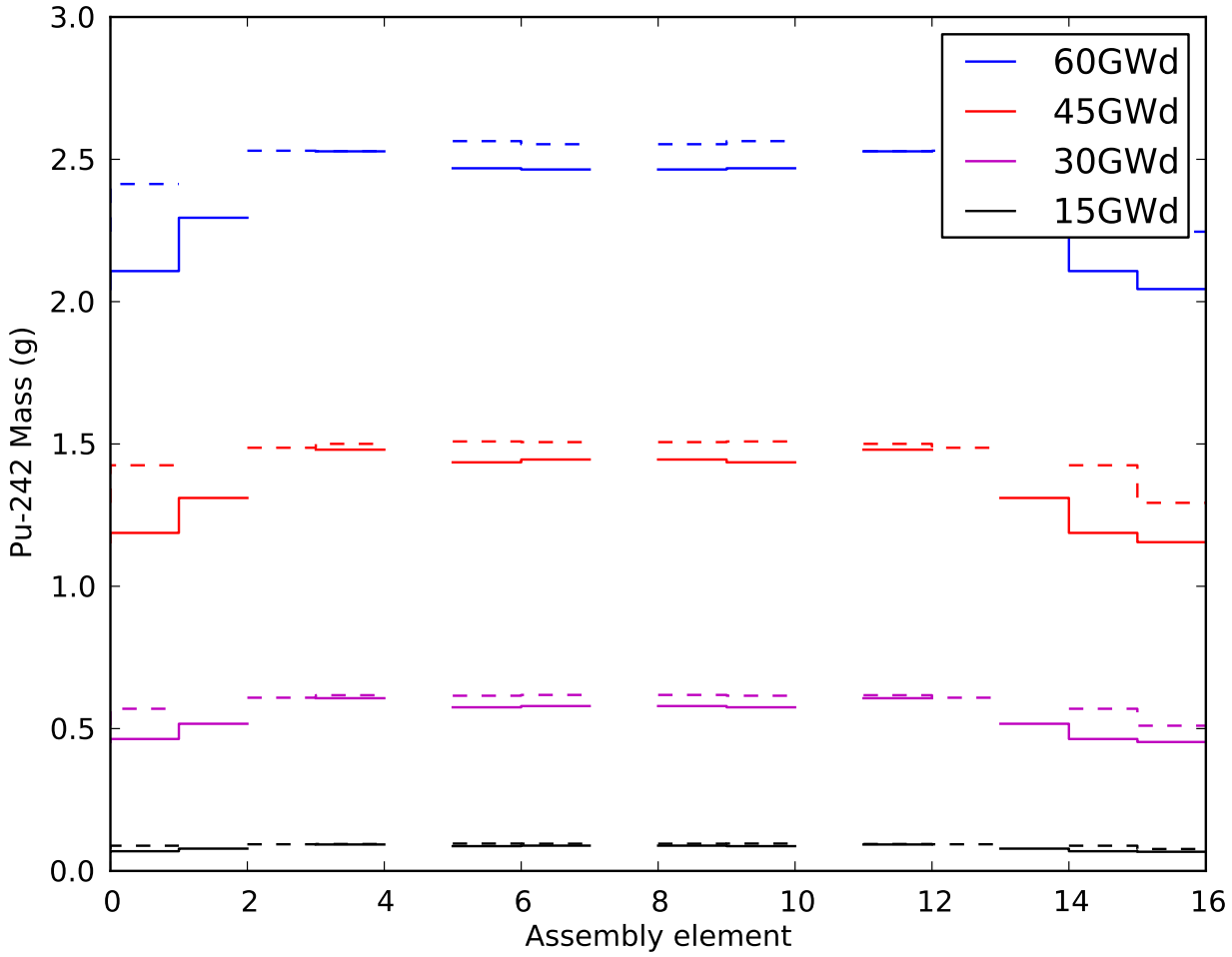
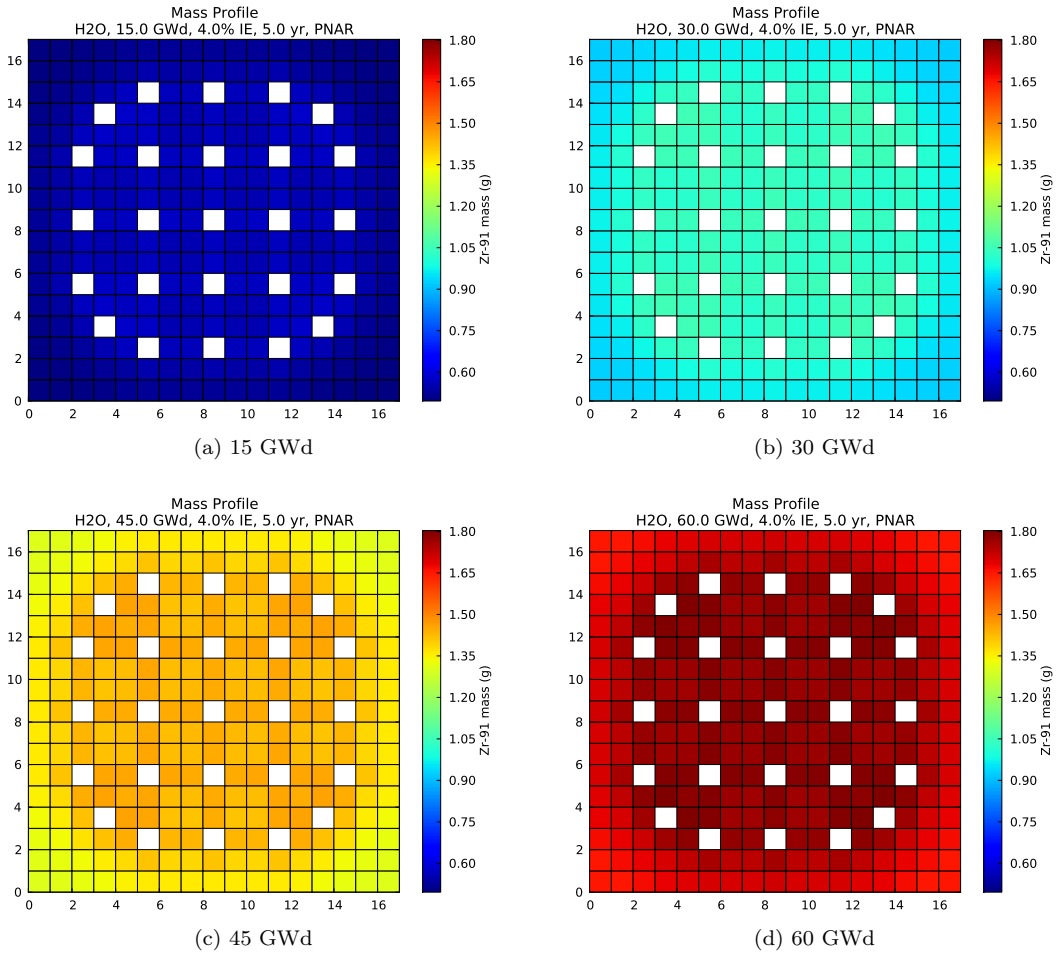


Figure 14: ^{242}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.8 Zr-91



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 15: Change in mass of ^{91}Zr with an increase in Burnup.

Figure 15 shows the change in the mass of ^{91}Zr for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{91}Zr (460.6 g) occurs when Burnup is 60 GWd, and the smallest mass (143.8 g) occurs when Burnup is 15 GWd; the overall change in mass is 68.79 %. The change in the mass of ^{91}Zr in the individual assemblies is given in Table 136.

Parameter	min (location)	max (location)	% diff
15	0.4958 (-8, -8, 0)	0.5789 (4, -5, 0)	14.36
30	0.9243 (-8, -8, 0)	1.0567 (4, -5, 0)	12.53
45	1.3055 (-8, -8, 0)	1.4584 (4, -5, 0)	10.48
60	1.6501 (-8, -8, 0)	1.8033 (4, -5, 0)	8.50

Table 136: The change in the mass of ^{91}Zr for each assembly shown in Figure 15. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{91}Zr in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

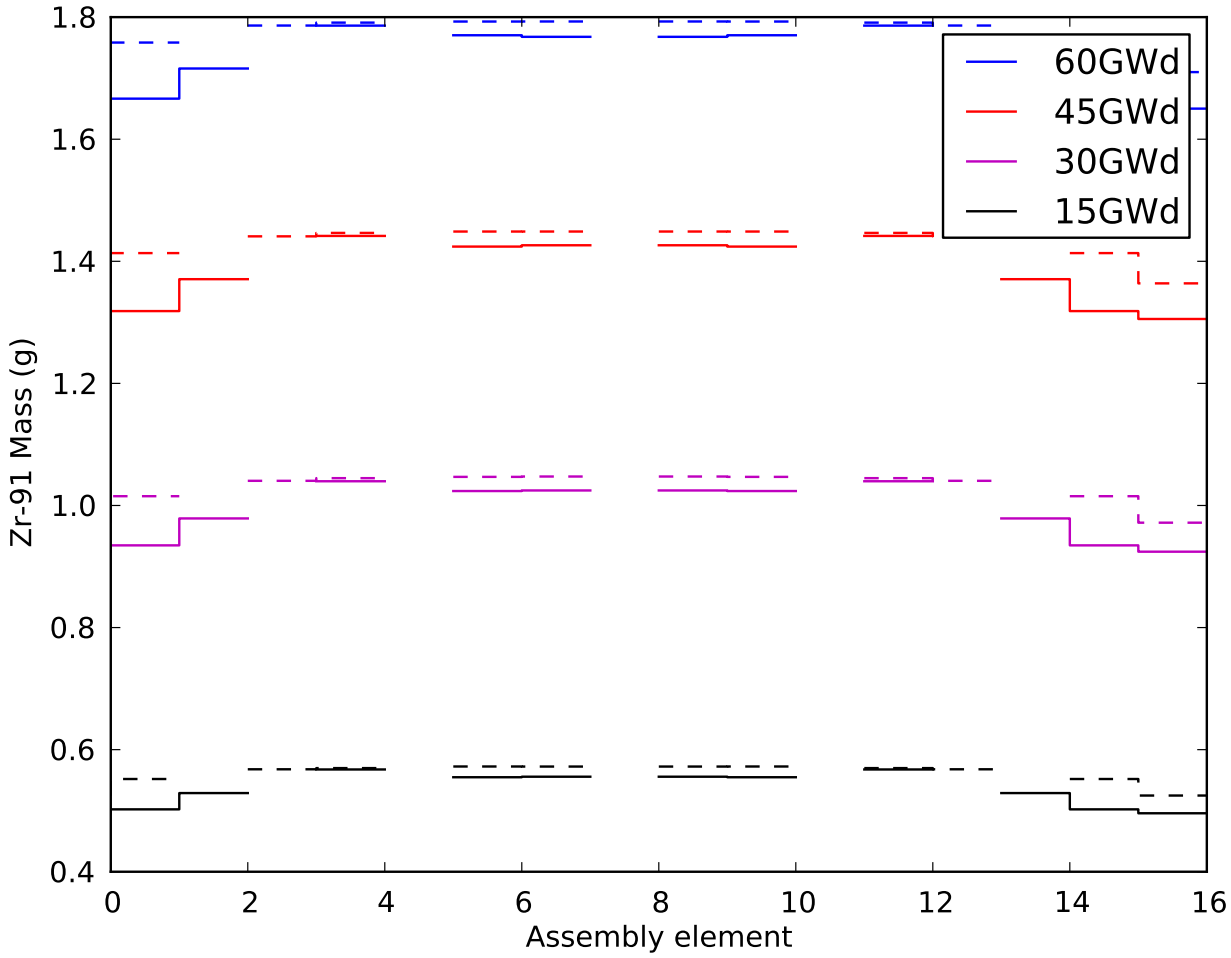
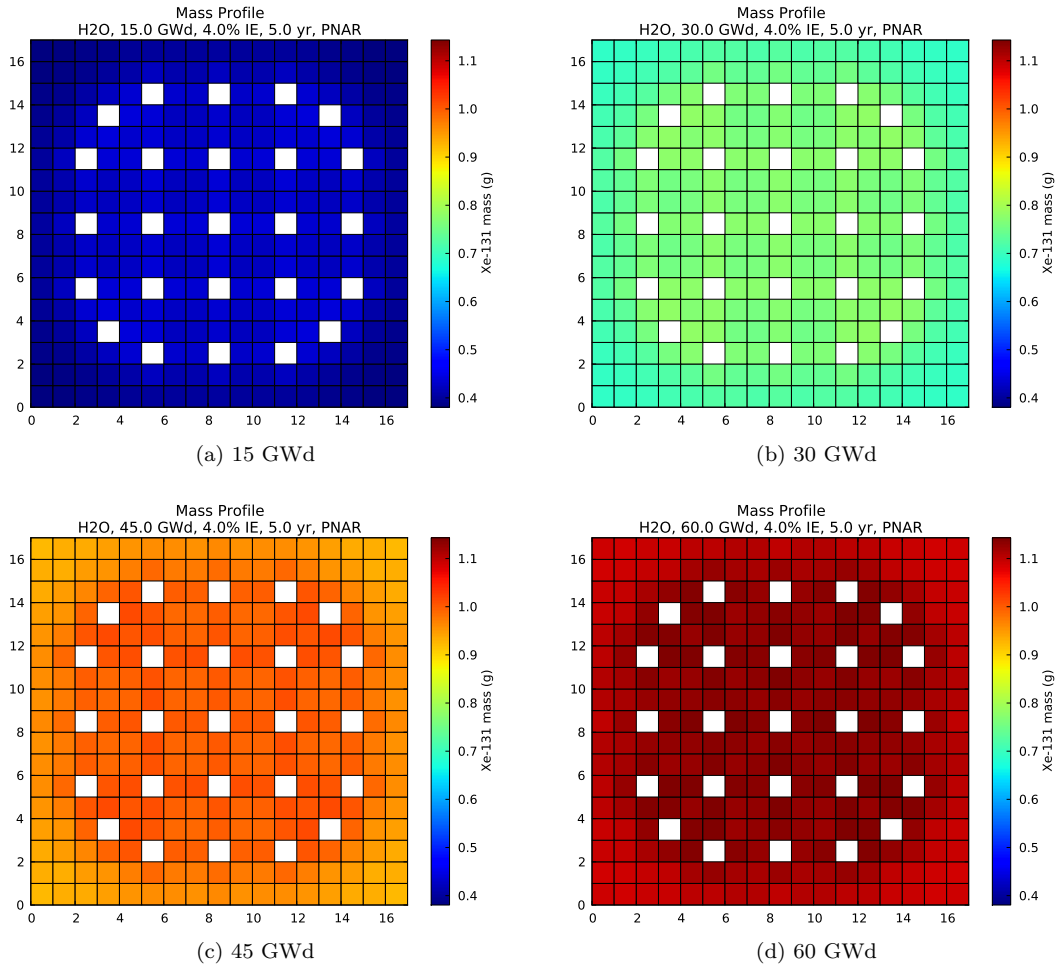


Figure 16: ^{91}Zr mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.9 Xe-131



(a) 15 GWd (b) 30 GWd

(c) 45 GWd (d) 60 GWd

Figure 17: Change in mass of ^{131}Xe with an increase in Burnup.

Figure 17 shows the change in the mass of ^{131}Xe for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{131}Xe (295.8 g) occurs when Burnup is 60 GWd, and the smallest mass (110.1 g) occurs when Burnup is 15 GWd; the overall change in mass is 62.79 %. The change in the mass of ^{131}Xe in the individual assemblies is given in Table 137.

Parameter	min (location)	max (location)	% diff
15	0.3806 (-8, -8, 0)	0.4423 (4, -5, 0)	13.95
30	0.6919 (-8, -8, 0)	0.7799 (4, -5, 0)	11.28
45	0.9256 (-8, -8, 0)	1.0127 (4, -5, 0)	8.60
60	1.0878 (-7, -8, 0)	1.1432 (-5, 3, 0)	4.84

Table 137: The change in the mass of ^{131}Xe for each assembly shown in Figure 17. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{131}Xe in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

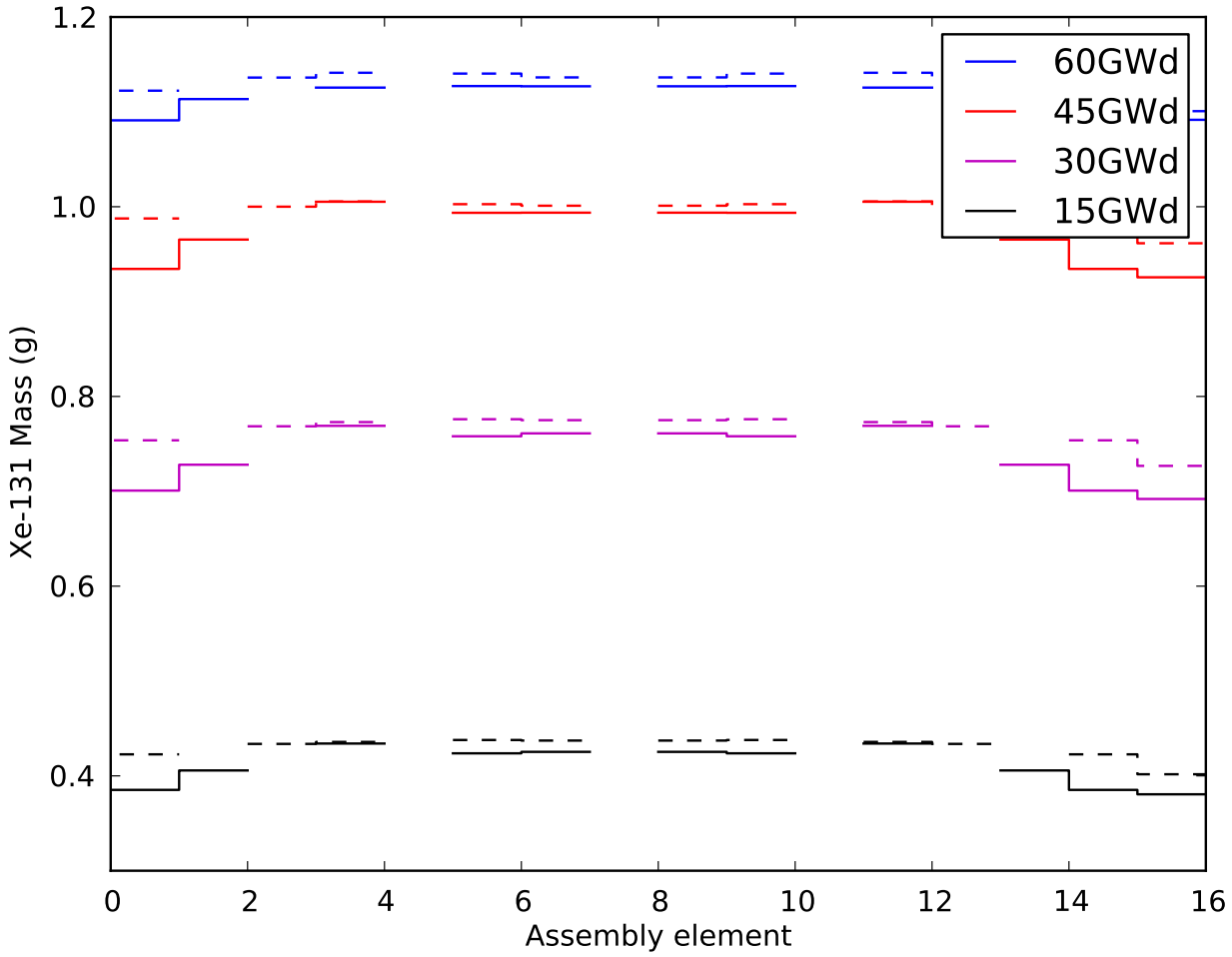
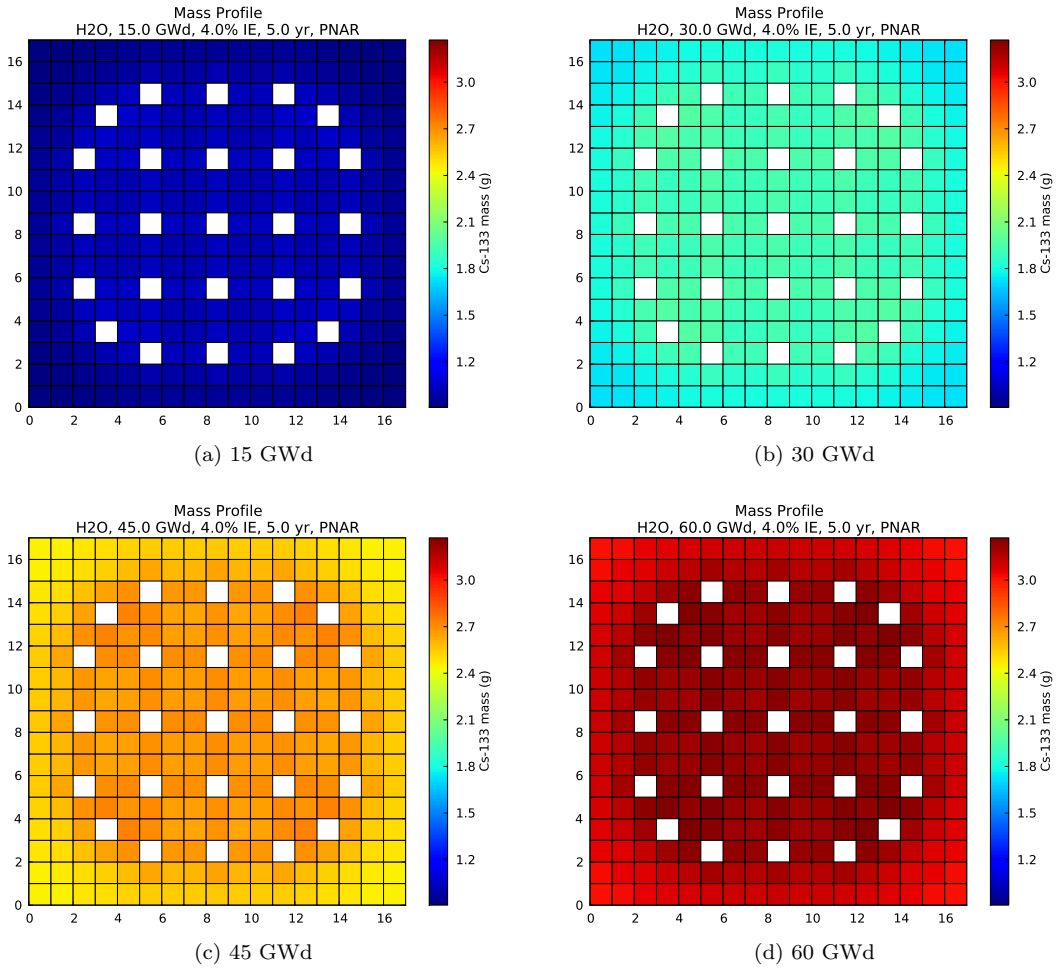


Figure 18: ^{131}Xe mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.10 Cs-133



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 19: Change in mass of ^{133}Cs with an increase in Burnup.

Figure 19 shows the change in the mass of ^{133}Cs for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{133}Cs (837.6 g) occurs when Burnup is 60 GWd, and the smallest mass (262.6 g) occurs when Burnup is 15 GWd; the overall change in mass is 68.64 %. The change in the mass of ^{133}Cs in the individual assemblies is given in Table 138.

Parameter	min (location)	max (location)	% diff
15	0.9067 (-8, -8, 0)	1.0577 (4, -5, 0)	14.28
30	1.7280 (-8, -8, 0)	1.9711 (4, -5, 0)	12.33
45	2.4544 (-8, -8, 0)	2.7275 (4, -5, 0)	10.01
60	3.0186 (-8, -8, 0)	3.2720 (4, -5, 0)	7.74

Table 138: The change in the mass of ^{133}Cs for each assembly shown in Figure 19. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{133}Cs in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

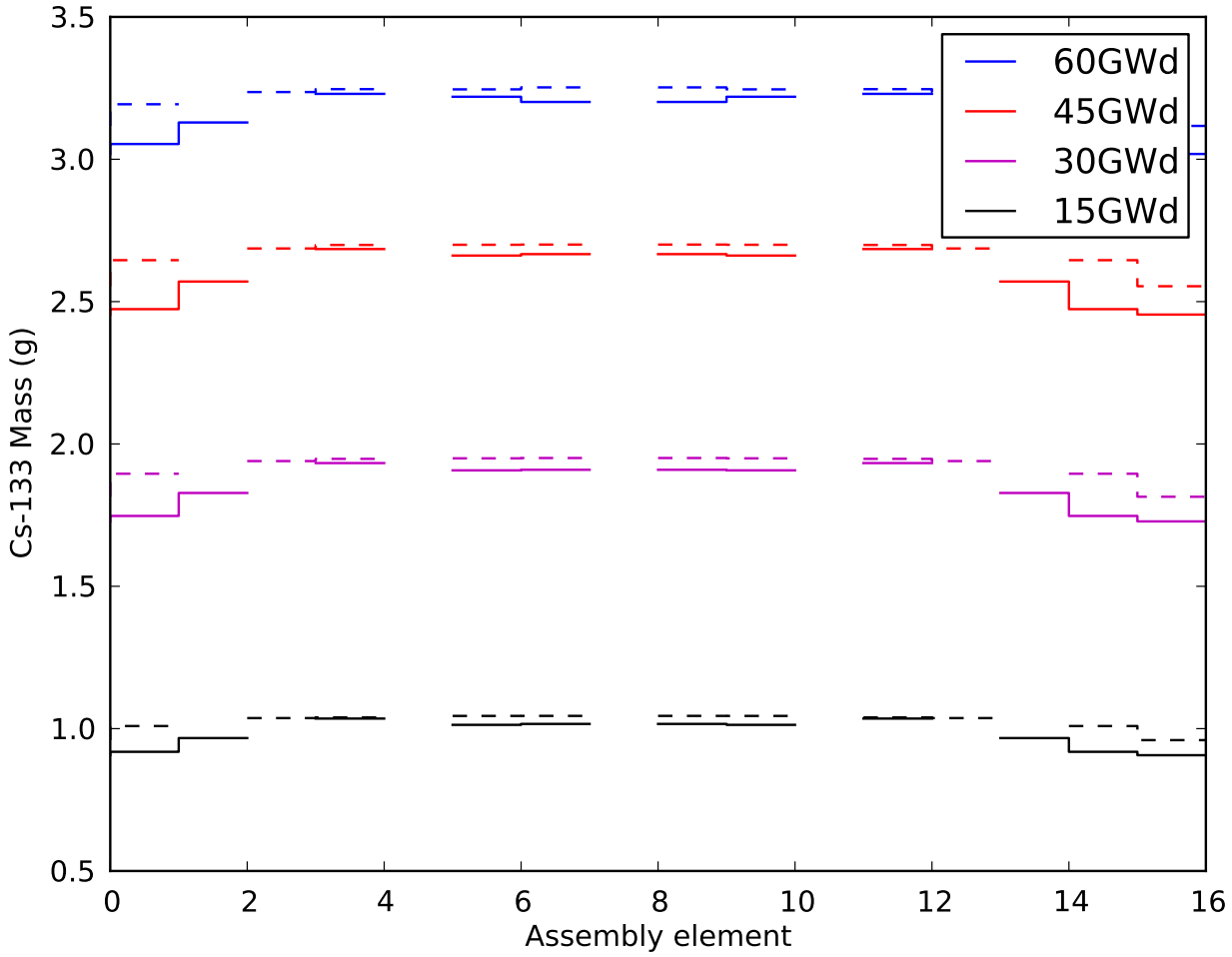
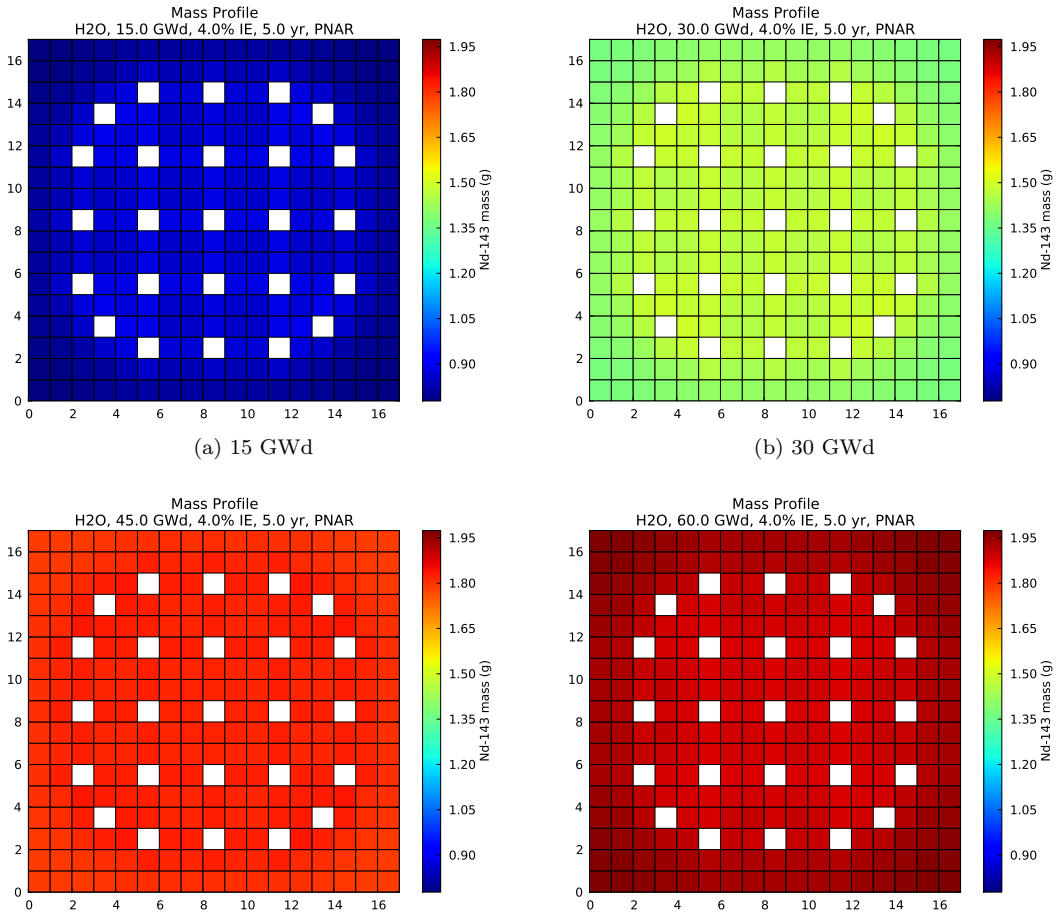


Figure 20: ^{133}Cs mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.11 Nd-143



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 21: Change in mass of ^{143}Nd with an increase in Burnup.

Figure 21 shows the change in the mass of ^{143}Nd for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{143}Nd (505.4 g) occurs when Burnup is 60 GWd, and the smallest mass (222.8 g) occurs when Burnup is 15 GWd; the overall change in mass is 55.91 %. The change in the mass of ^{143}Nd in the individual assemblies is given in Table 139.

Parameter	min (location)	max (location)	% diff
15	0.7775 (-8, -8, 0)	0.8905 (4, -5, 0)	12.69
30	1.3690 (-8, -8, 0)	1.4933 (4, -5, 0)	8.32
45	1.7881 (-8, -8, 0)	1.8342 (-4, 6, 0)	2.51
60	1.8761 (4, -3, 0)	1.9742 (-8, -8, 0)	4.97

Table 139: The change in the mass of ^{143}Nd for each assembly shown in Figure 21. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{143}Nd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

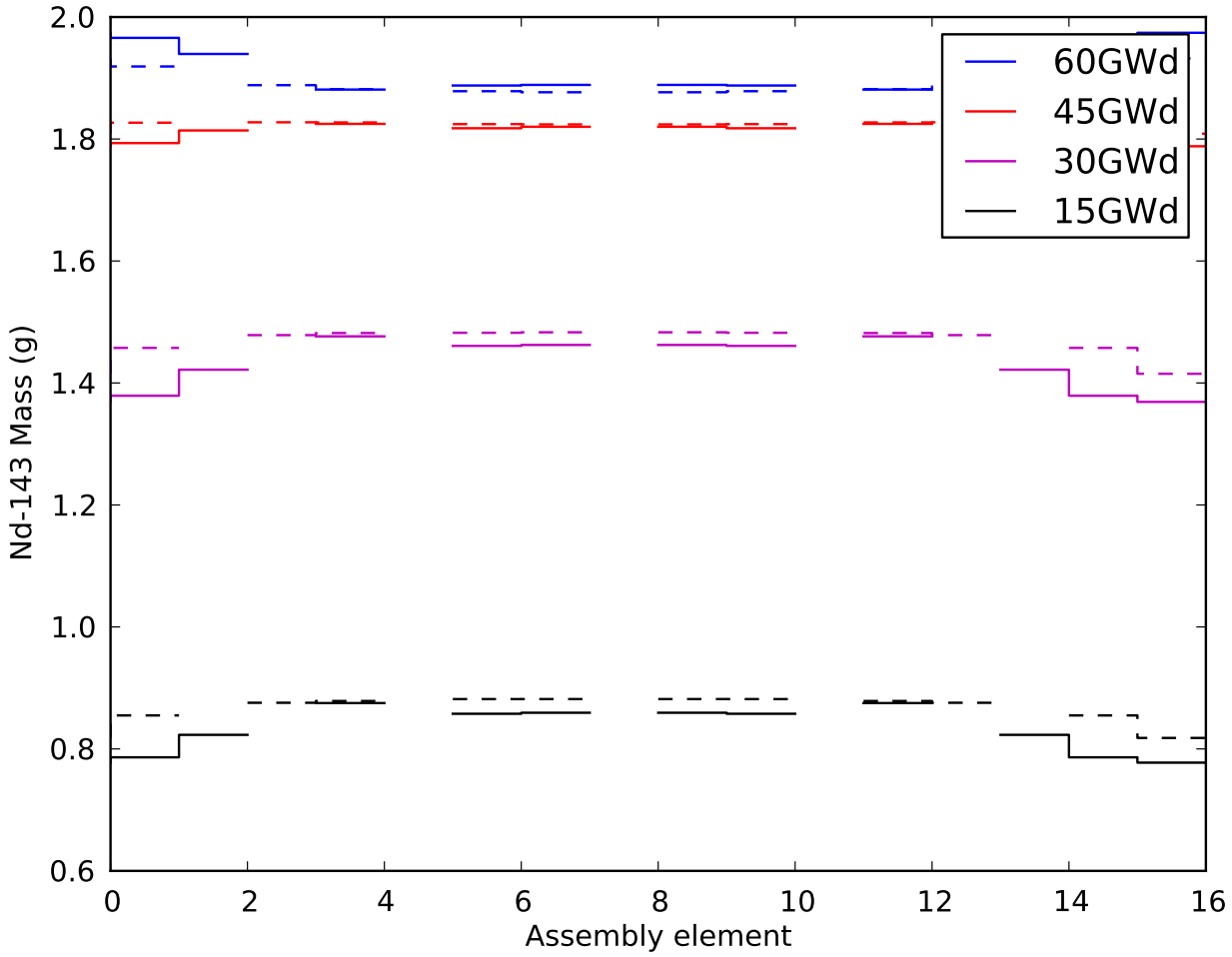
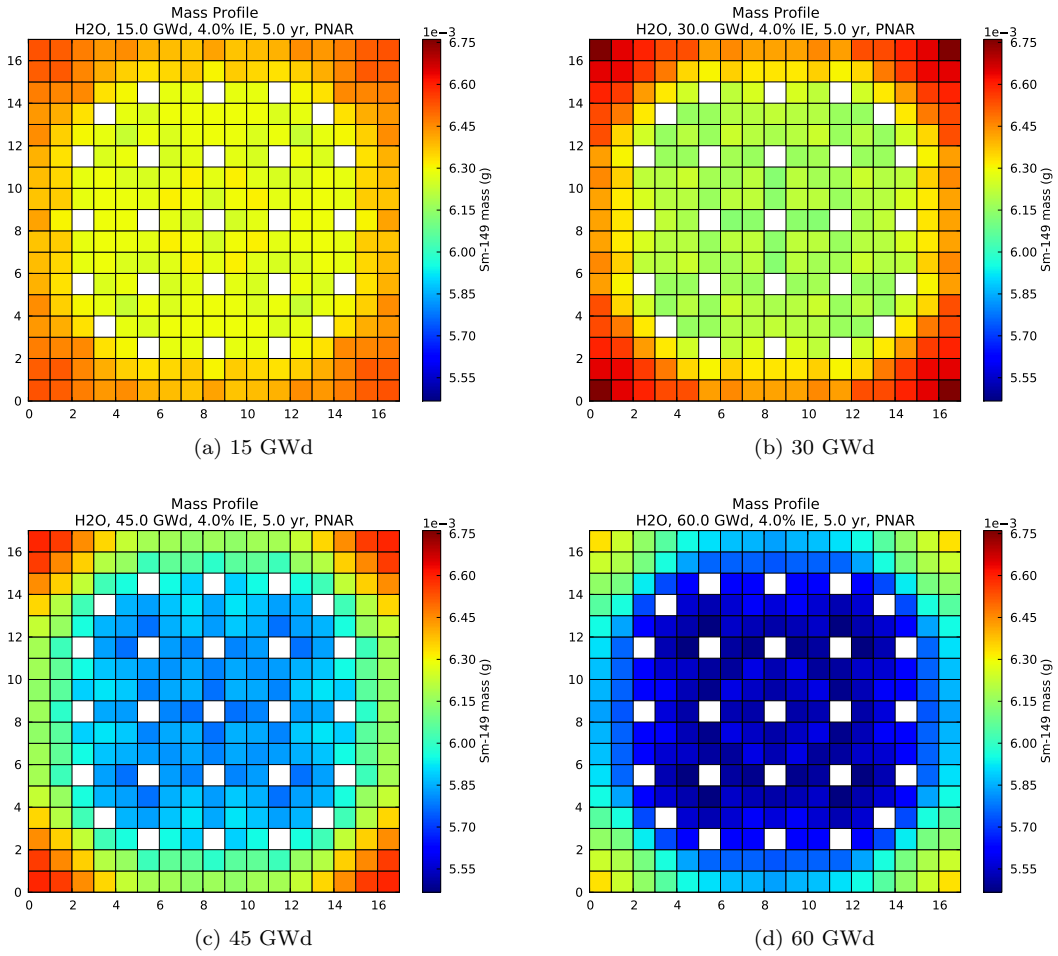


Figure 22: ^{143}Nd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.12 Sm-149



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 23: Change in mass of ^{149}Sm with an increase in Burnup.

Figure 23 shows the change in the mass of ^{149}Sm for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{149}Sm (1.675 g) occurs when Burnup is 15 GWd, and the smallest mass (1.516 g) occurs when Burnup is 60 GWd; the overall change in mass is 9.49 %. The change in the mass of ^{149}Sm in the individual assemblies is given in Table 140.

Parameter	min (location)	max (location)	% diff
15	0.0062 (-4, -4, 0)	0.0065 (-8, -8, 0)	4.54
30	0.0061 (2, 0, 0)	0.0068 (-8, -8, 0)	9.30
45	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48
60	0.0055 (4, -3, 0)	0.0063 (-8, -8, 0)	13.68

Table 140: The change in the mass of ^{149}Sm for each assembly shown in Figure 23. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{149}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

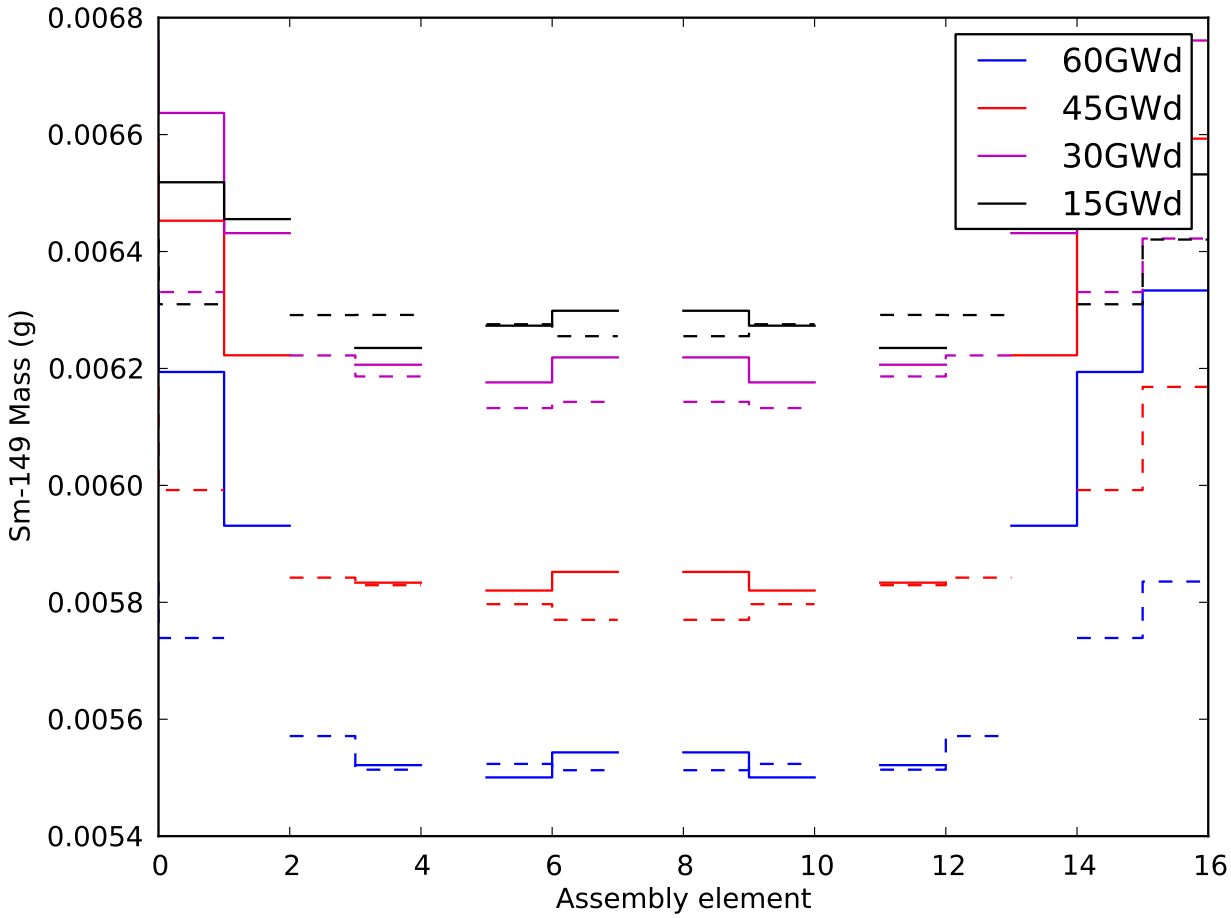
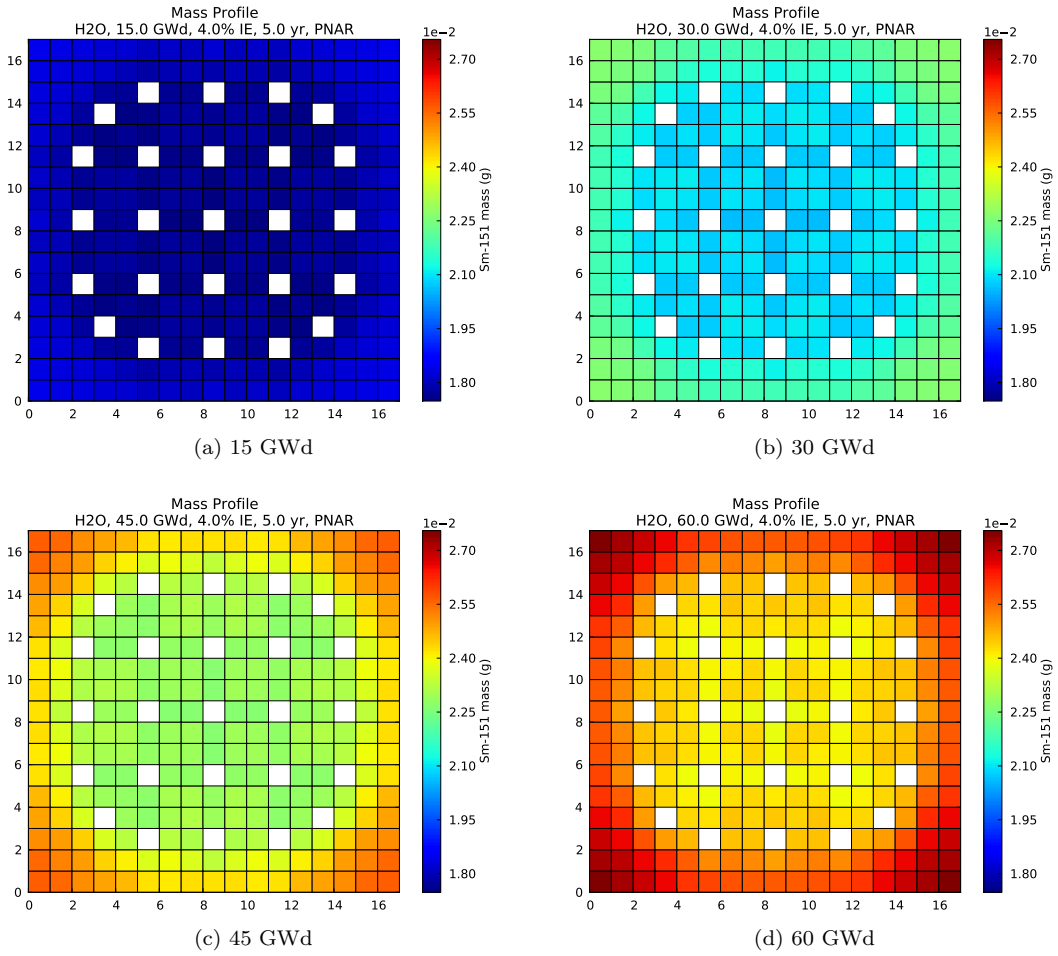


Figure 24: ^{149}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.13 Sm-151



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 25: Change in mass of ^{151}Sm with an increase in Burnup.

Figure 25 shows the change in the mass of ^{151}Sm for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{151}Sm (6.635 g) occurs when Burnup is 60 GWd, and the smallest mass (4.721 g) occurs when Burnup is 15 GWd; the overall change in mass is 28.84 %. The change in the mass of ^{151}Sm in the individual assemblies is given in Table 141.

Parameter	min (location)	max (location)	% diff
15	0.0175 (2, 0, 0)	0.0185 (-8, -8, 0)	5.32
30	0.0206 (2, 0, 0)	0.0227 (-8, -8, 0)	9.22
45	0.0226 (-1, 0, 0)	0.0256 (-8, -8, 0)	11.74
60	0.0238 (-1, 0, 0)	0.0276 (-8, -8, 0)	13.44

Table 141: The change in the mass of ^{151}Sm for each assembly shown in Figure 25. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{151}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

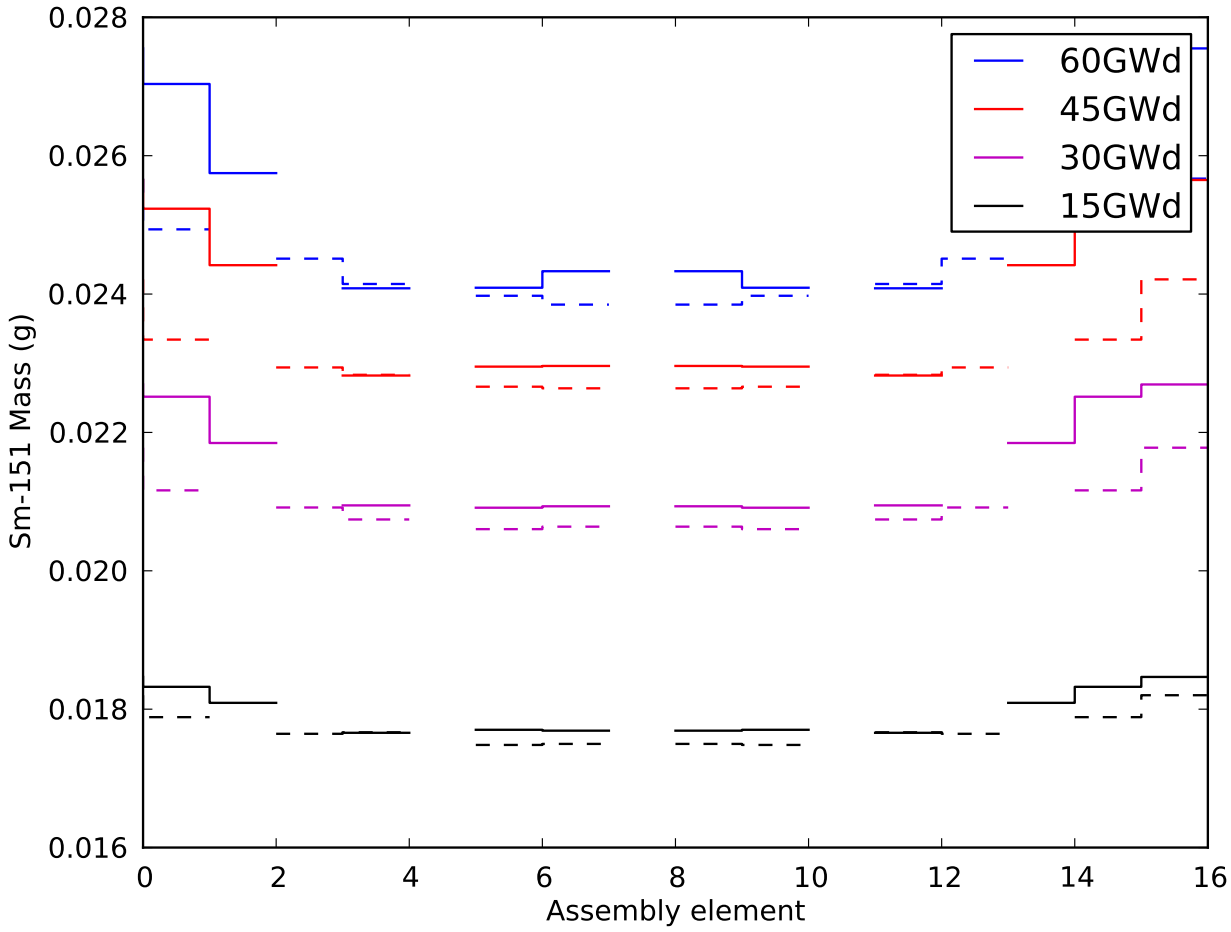
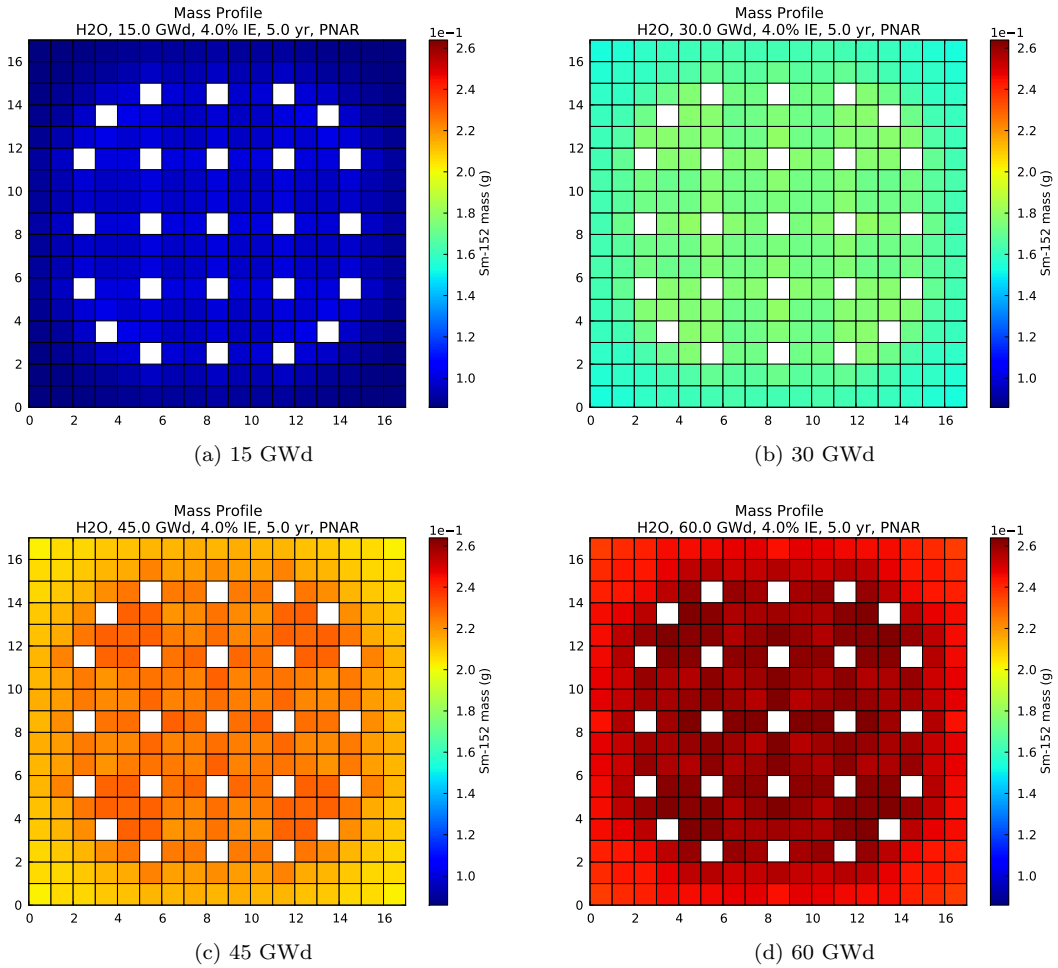


Figure 26: ^{151}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.14 Sm-152



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 27: Change in mass of ^{152}Sm with an increase in Burnup.

Figure 27 shows the change in the mass of ^{152}Sm for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{152}Sm (67.03 g) occurs when Burnup is 60 GWd, and the smallest mass (25.1 g) occurs when Burnup is 15 GWd; the overall change in mass is 62.55 %. The change in the mass of ^{152}Sm in the individual assemblies is given in Table 142.

Parameter	min (location)	max (location)	% diff
15	0.0858 (-7, -8, 0)	0.1023 (4, -5, 0)	16.12
30	0.1536 (-8, -8, 0)	0.1794 (0, 4, 0)	14.40
45	0.2026 (-8, -8, 0)	0.2294 (2, 0, 0)	11.69
60	0.2366 (-8, -8, 0)	0.2639 (4, -5, 0)	10.35

Table 142: The change in the mass of ^{152}Sm for each assembly shown in Figure 27. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{152}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

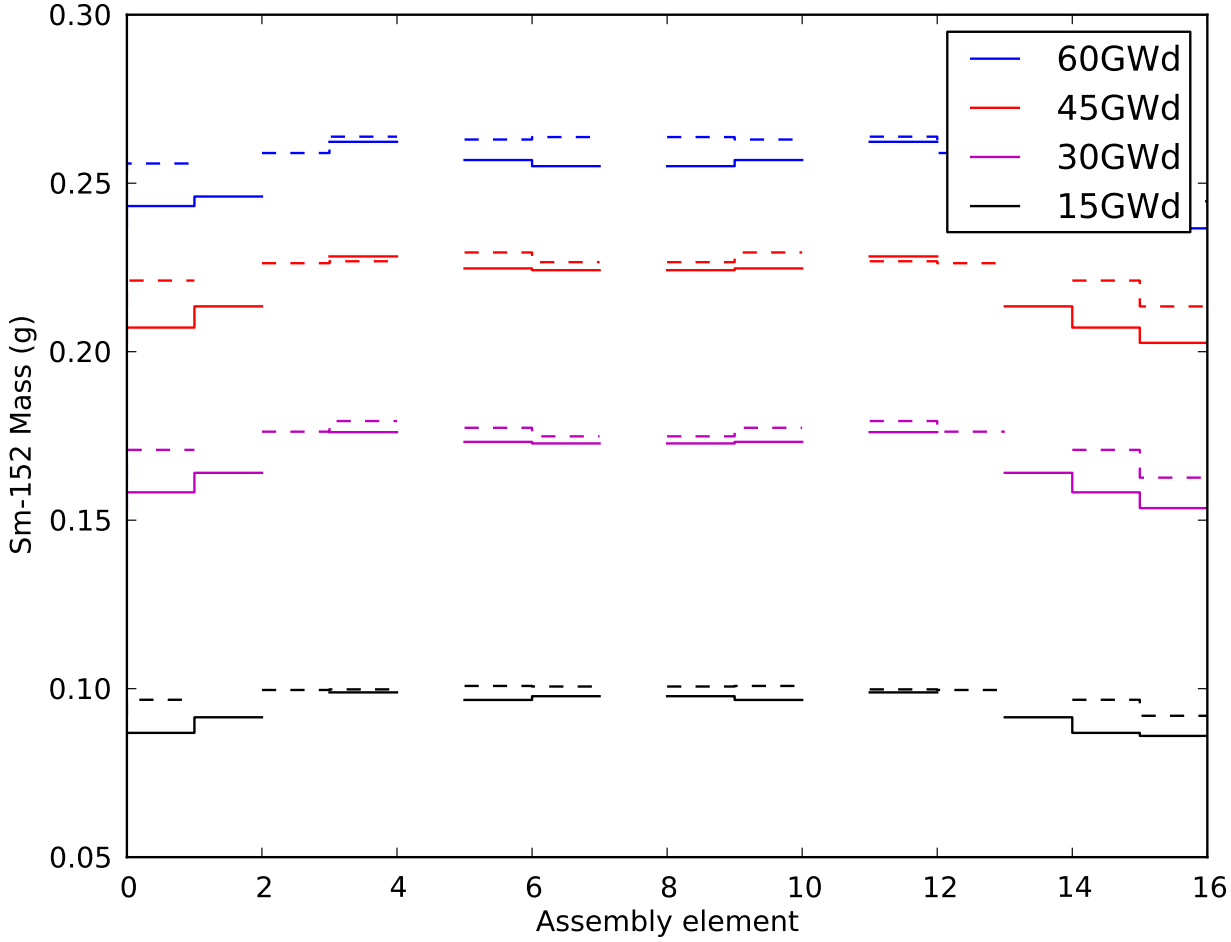
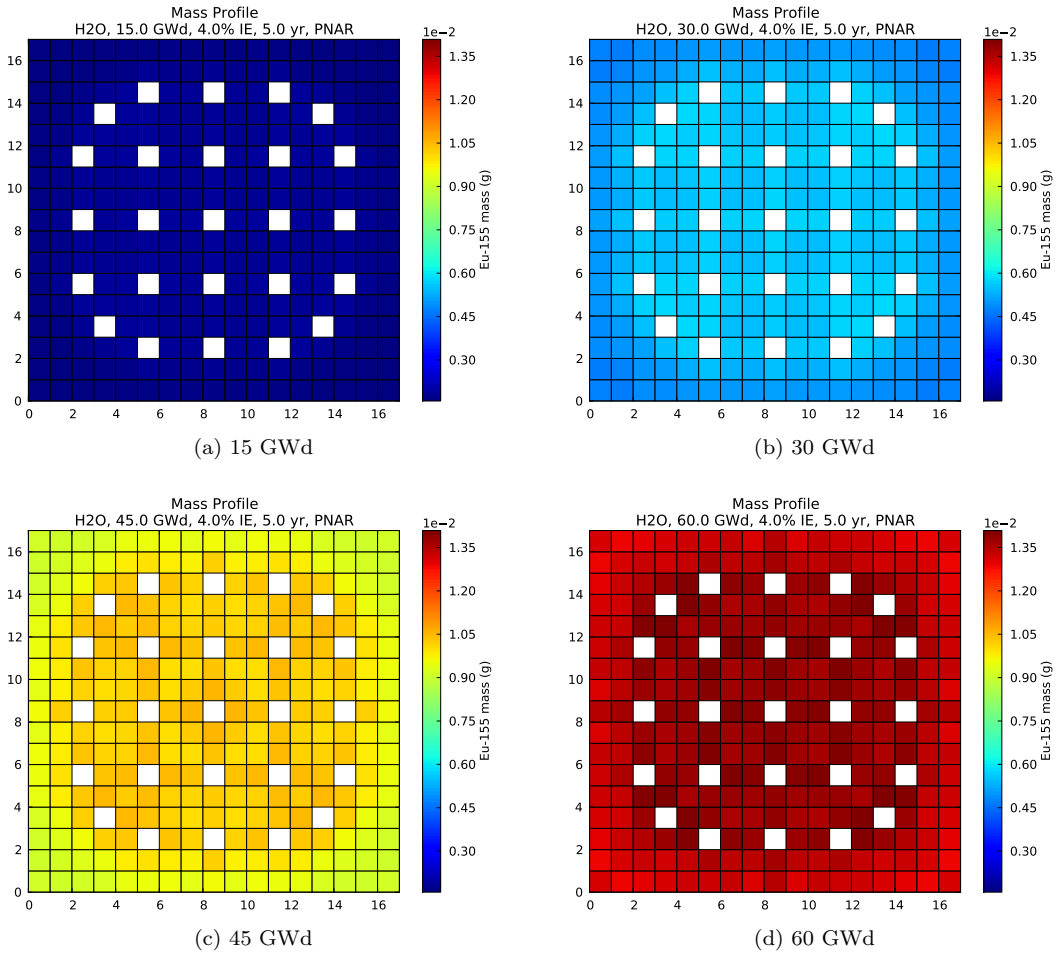


Figure 28: ^{152}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.15 Eu-155



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 29: Change in mass of ^{155}Eu with an increase in Burnup.

Figure 29 shows the change in the mass of ^{155}Eu for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{155}Eu (3.581 g) occurs when Burnup is 60 GWd, and the smallest mass (0.4662 g) occurs when Burnup is 15 GWd; the overall change in mass is 86.98 %. The change in the mass of ^{155}Eu in the individual assemblies is given in Table 143.

Parameter	min (location)	max (location)	% diff
15	0.0016 (-8, -8, 0)	0.0019 (2, 0, 0)	17.20
30	0.0047 (-7, -8, 0)	0.0058 (4, -5, 0)	19.13
45	0.0091 (-7, -8, 0)	0.0106 (-1, 0, 0)	13.85
60	0.0129 (-7, -8, 0)	0.0141 (4, -5, 0)	8.53

Table 143: The change in the mass of ^{155}Eu for each assembly shown in Figure 29. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Eu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

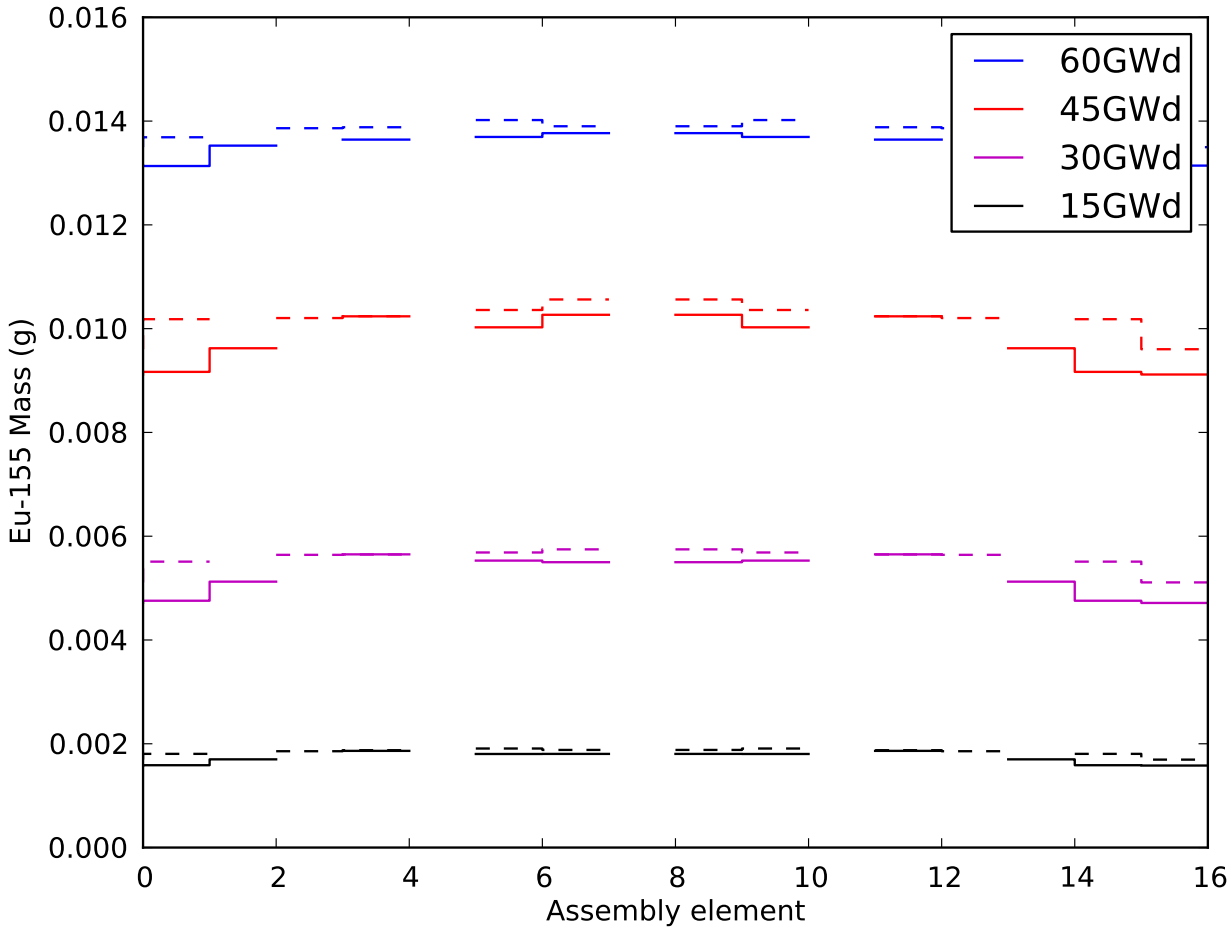
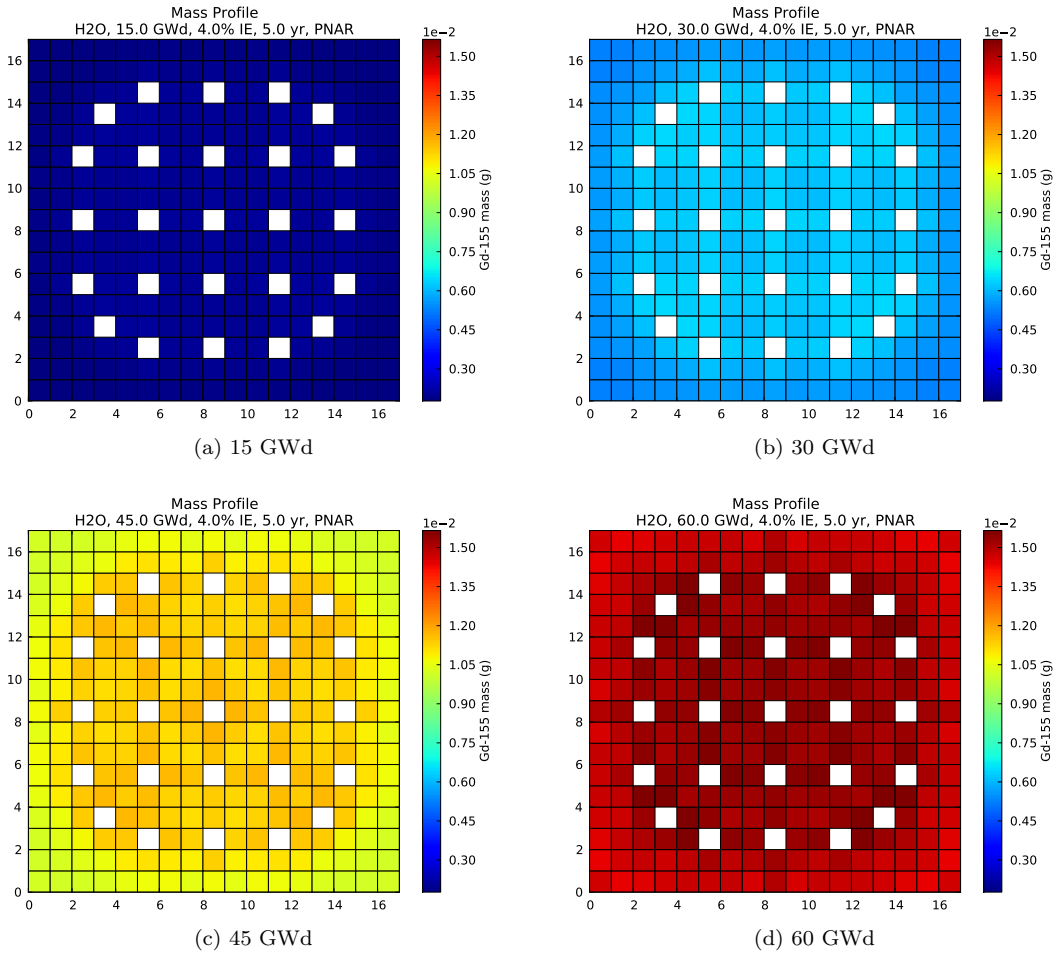


Figure 30: ^{155}Eu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.16 Gd-155



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 31: Change in mass of ^{155}Gd with an increase in Burnup.

Figure 31 shows the change in the mass of ^{155}Gd for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{155}Gd (3.985 g) occurs when Burnup is 60 GWd, and the smallest mass (0.5198 g) occurs when Burnup is 15 GWd; the overall change in mass is 86.95 %. The change in the mass of ^{155}Gd in the individual assemblies is given in Table 144.

Parameter	min (location)	max (location)	% diff
15	0.0018 (-8, -8, 0)	0.0021 (2, 0, 0)	16.87
30	0.0053 (-7, -8, 0)	0.0065 (4, -5, 0)	18.75
45	0.0102 (-7, -8, 0)	0.0117 (-1, 0, 0)	13.44
60	0.0144 (-7, -8, 0)	0.0157 (4, -5, 0)	8.14

Table 144: The change in the mass of ^{155}Gd for each assembly shown in Figure 31. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Gd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

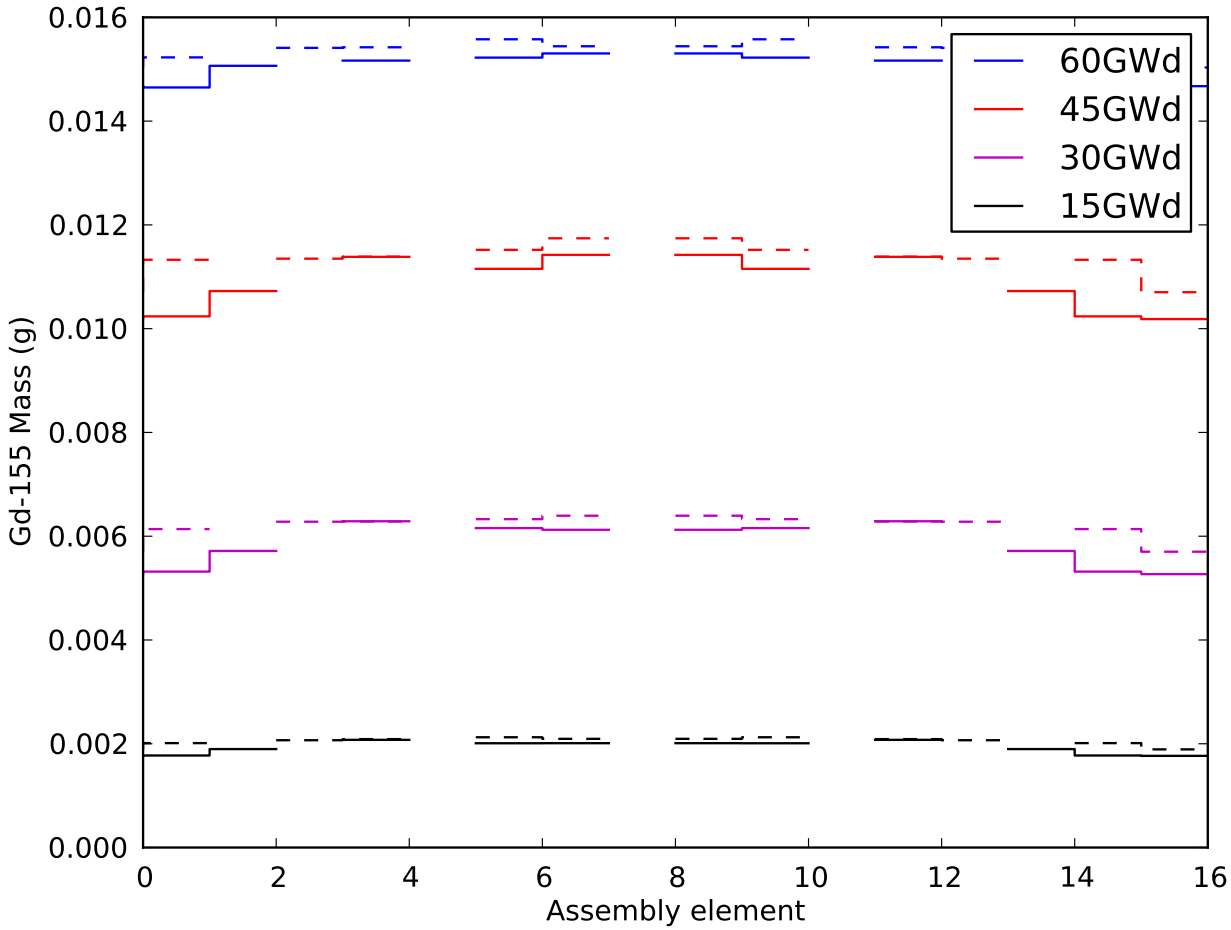
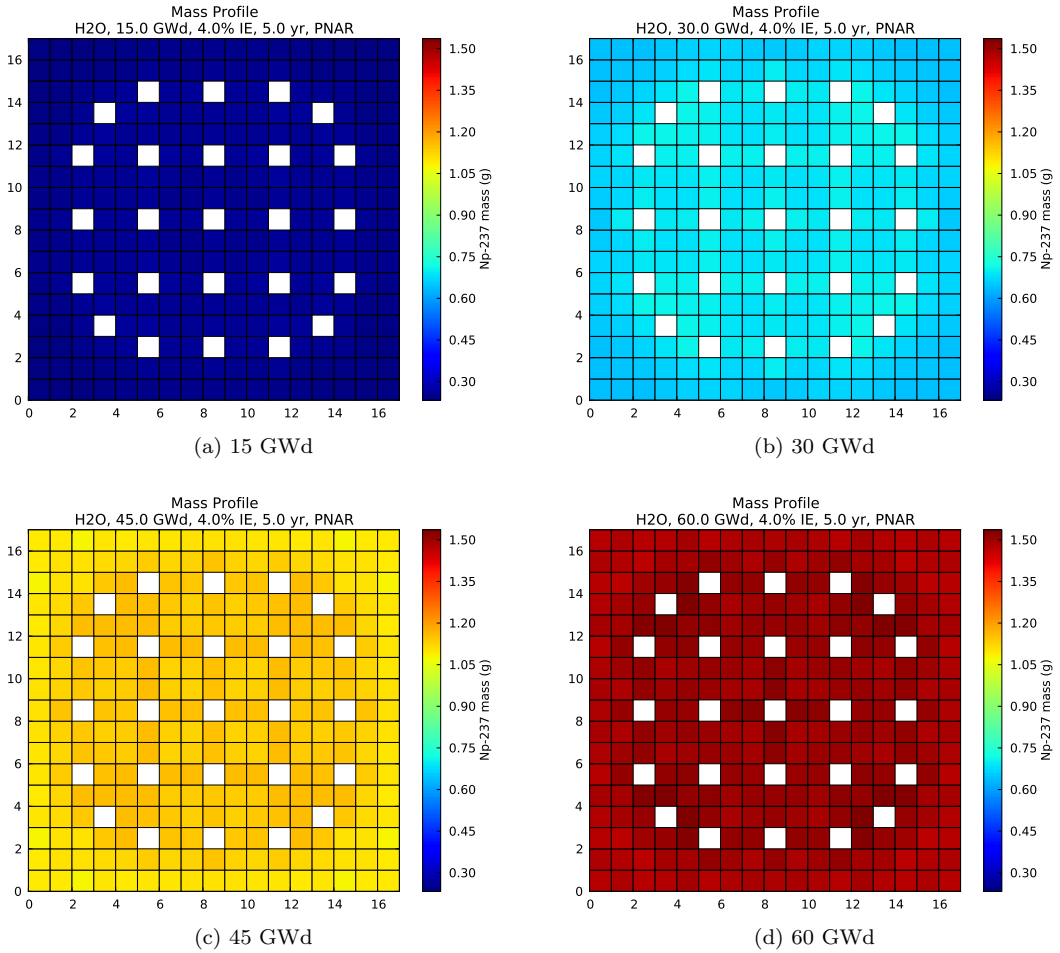


Figure 32: ^{155}Gd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.17 Np-237



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 33: Change in mass of ^{237}Np with an increase in Burnup.

Figure 33 shows the change in the mass of ^{237}Np for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{237}Np (395.6 g) occurs when Burnup is 60 GWd, and the smallest mass (66.73 g) occurs when Burnup is 15 GWd; the overall change in mass is 83.13 %. The change in the mass of ^{237}Np in the individual assemblies is given in Table 145.

Parameter	min (location)	max (location)	% diff
15	0.2329 (-7, -8, 0)	0.2663 (-5, 3, 0)	12.53
30	0.6442 (-7, -8, 0)	0.7101 (4, -5, 0)	9.29
45	1.0828 (6, -8, 0)	1.1596 (4, -5, 0)	6.62
60	1.4700 (6, 7, 0)	1.5364 (4, -5, 0)	4.33

Table 145: The change in the mass of ^{237}Np for each assembly shown in Figure 33. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{237}Np in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

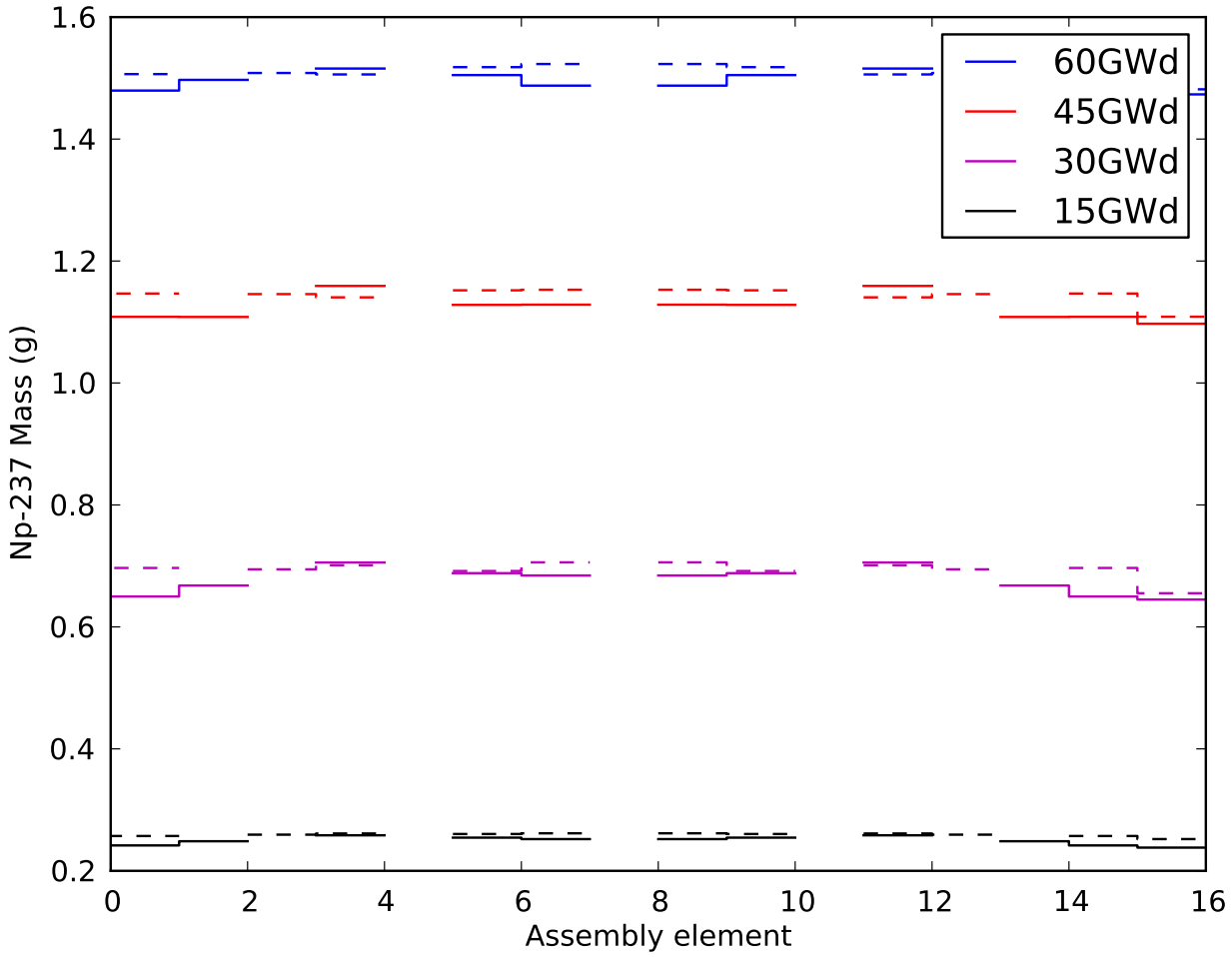
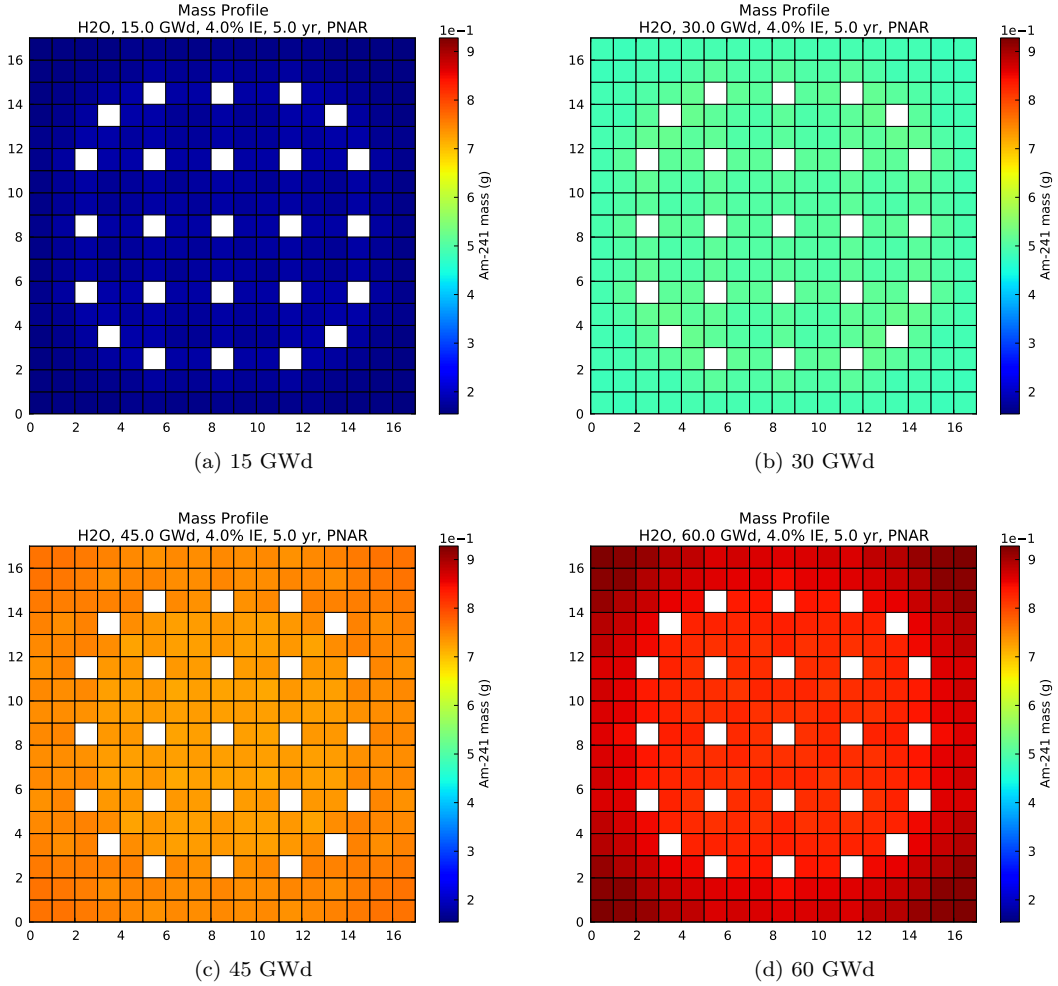


Figure 34: ^{237}Np mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

2.18 Am-241



(a) 15 GWd

(b) 30 GWd

(c) 45 GWd

(d) 60 GWd

Figure 35: Change in mass of ^{241}Am with an increase in Burnup.

Figure 35 shows the change in the mass of ^{241}Am for a change in Burnup; the range of Burnup is 15–60 GWd. The largest mass of ^{241}Am (225.2 g) occurs when Burnup is 60 GWd, and the smallest mass (45.42 g) occurs when Burnup is 15 GWd; the overall change in mass is 79.83 %. The change in the mass of ^{241}Am in the individual assemblies is given in Table 146.

Parameter	min (location)	max (location)	% diff
15	0.1544 (-8, -8, 0)	0.1842 (4, -5, 0)	16.14
30	0.4832 (-7, -8, 0)	0.5201 (4, -5, 0)	7.11
45	0.7201 (2, -2, 0)	0.7636 (-8, -8, 0)	5.68
60	0.8149 (2, -2, 0)	0.9278 (-8, -8, 0)	12.17

Table 146: The change in the mass of ^{241}Am for each assembly shown in Figure 35. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Am in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

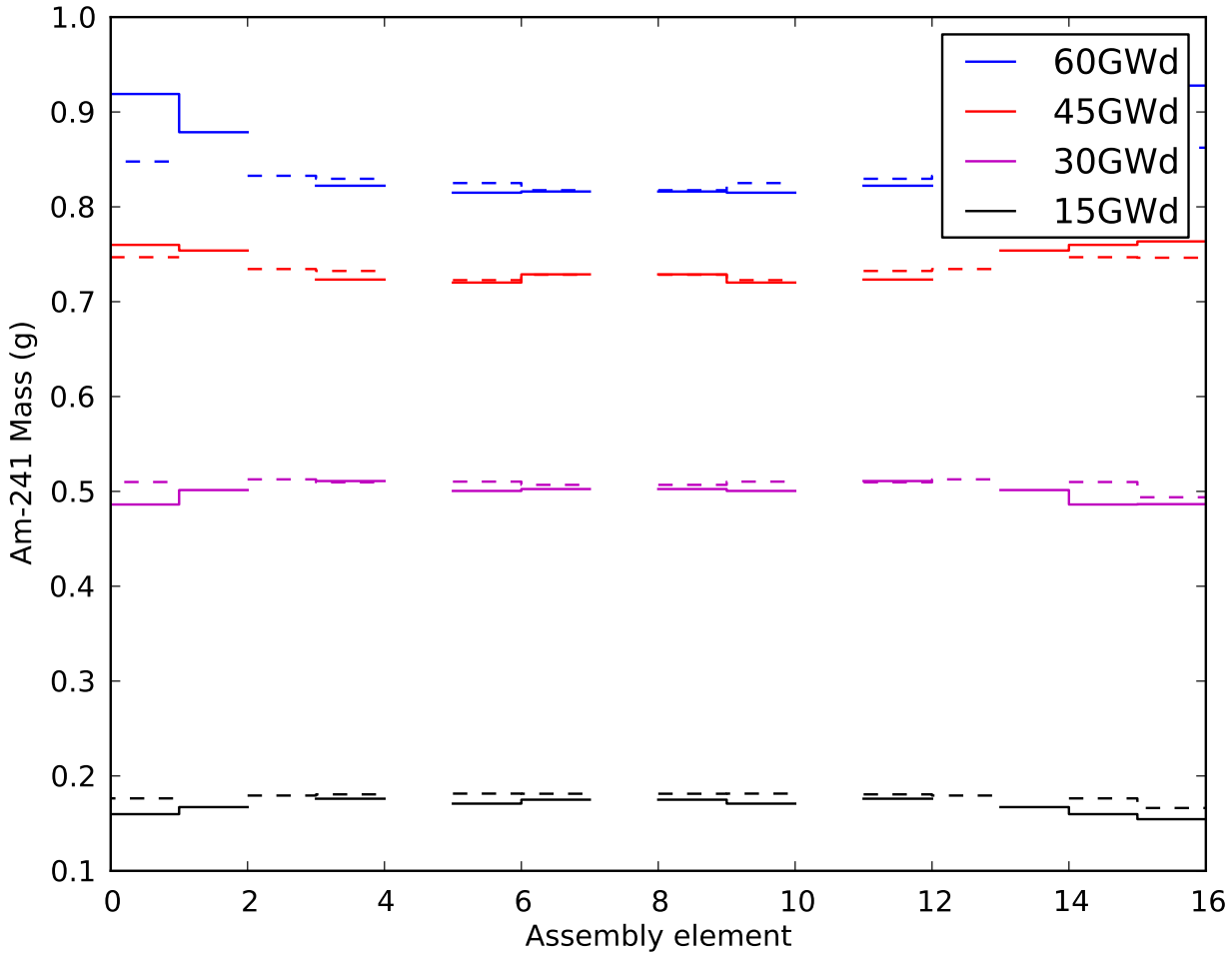
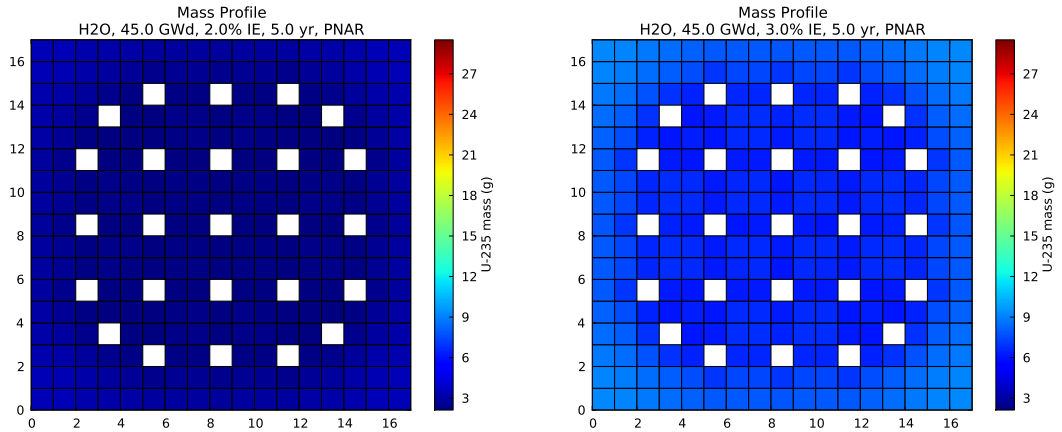


Figure 36: ^{241}Am mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3 Mass Changes with Enrichment

3.1 U-235



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 37: Change in mass of ^{235}U with an increase in Enrichment.

Figure 37 shows the change in the mass of ^{235}U for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{235}U (6633 g) occurs when Enrichment is 5 pct, and the smallest mass (681.7 g) occurs when Enrichment is 2 pct; the overall change in mass is 89.72 %. The change in the mass of ^{235}U in the individual assemblies is given in Table 147.

Parameter	min (location)	max (location)	% diff
2	2.1220 (4, -3, 0)	3.5049 (-8, -8, 0)	39.46
3	6.1359 (4, -3, 0)	9.2517 (-8, -8, 0)	33.68
4	12.9773 (4, -5, 0)	18.2247 (-8, -8, 0)	28.79
5	22.3293 (4, -5, 0)	29.5171 (-8, -8, 0)	24.35

Table 147: The change in the mass of ^{235}U for each assembly shown in Figure 37. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{235}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

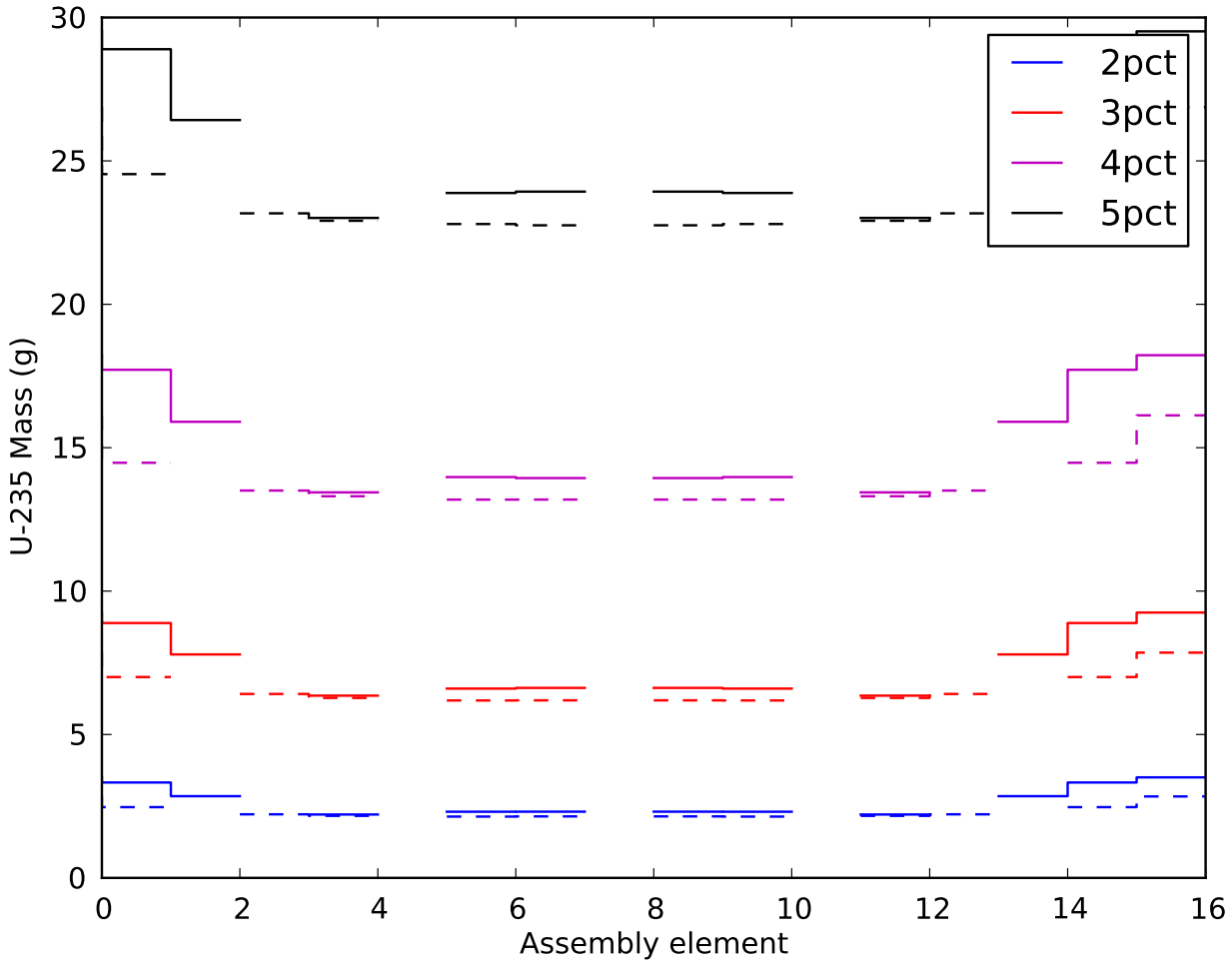
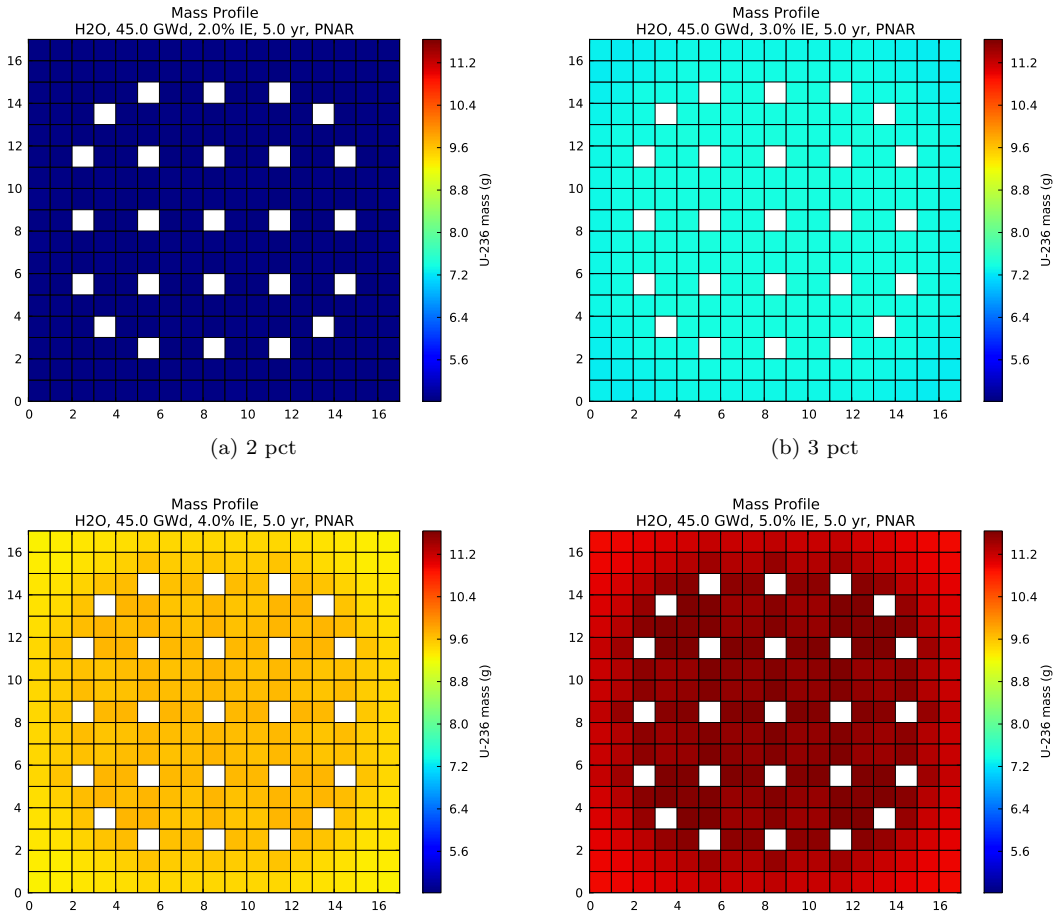


Figure 38: ^{235}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.2 U-236



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 39: Change in mass of ^{236}U with an increase in Enrichment.

Figure 39 shows the change in the mass of ^{236}U for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{236}U (3007 g) occurs when Enrichment is 5 pct, and the smallest mass (1280 g) occurs when Enrichment is 2 pct; the overall change in mass is 57.43 %. The change in the mass of ^{236}U in the individual assemblies is given in Table 148.

Parameter	min (location)	max (location)	% diff
2	4.8176 (4, -5, 0)	4.8748 (-8, -1, 0)	1.17
3	7.2564 (-7, -8, 0)	7.4142 (2, -2, 0)	2.13
4	9.2739 (-8, -8, 0)	9.7063 (4, -5, 0)	4.45
5	10.9530 (-8, -8, 0)	11.6406 (4, -5, 0)	5.91

Table 148: The change in the mass of ^{236}U for each assembly shown in Figure 39. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{236}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

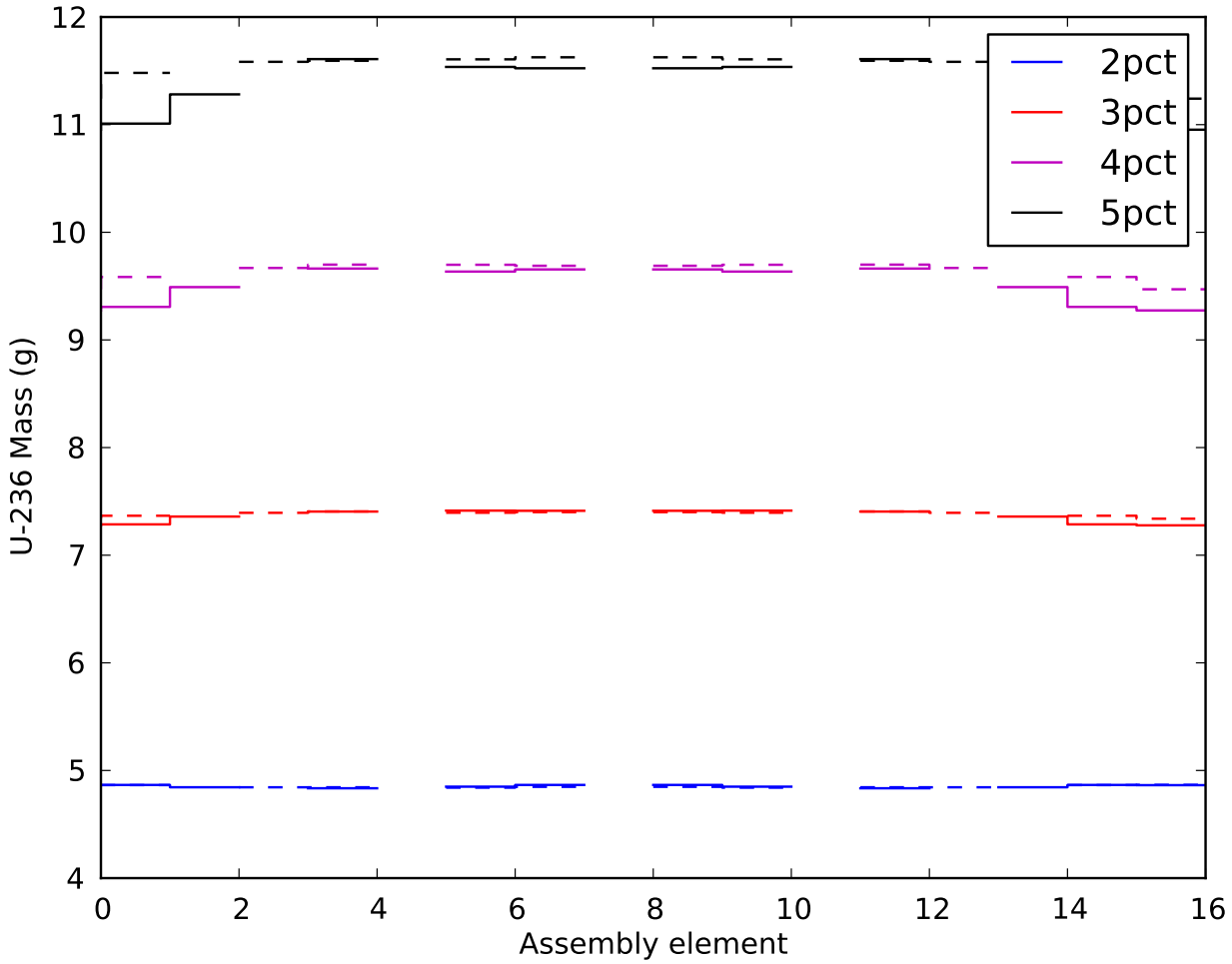
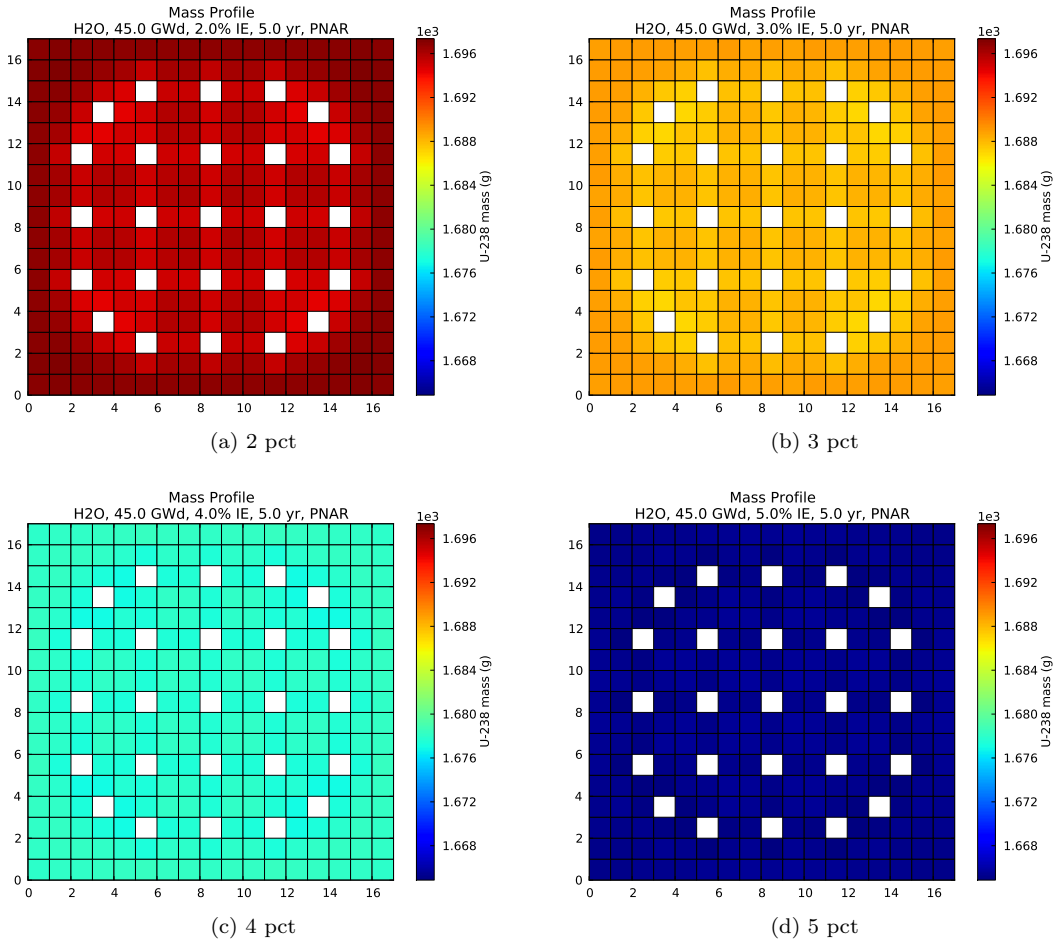


Figure 40: ^{236}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.3 U-238



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 41: Change in mass of ^{238}U with an increase in Enrichment.

Figure 41 shows the change in the mass of ^{238}U for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{238}U (4.477×10^5 g) occurs when Enrichment is 2 pct, and the smallest mass (4.396×10^5 g) occurs when Enrichment is 5 pct; the overall change in mass is 1.81 %. The change in the mass of ^{238}U in the individual assemblies is given in Table 149.

Parameter	min (location)	max (location)	% diff
2	1694.4903 (4, -5, 0)	1697.3525 (-7, 7, 0)	0.17
3	1687.0622 (4, -5, 0)	1689.0356 (6, -8, 0)	0.12
4	1676.9486 (-4, 6, 0)	1678.3526 (8, 3, 0)	0.08
5	1664.8649 (-4, 6, 0)	1665.6631 (1, -1, 0)	0.05

Table 149: The change in the mass of ^{238}U for each assembly shown in Figure 41. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{238}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

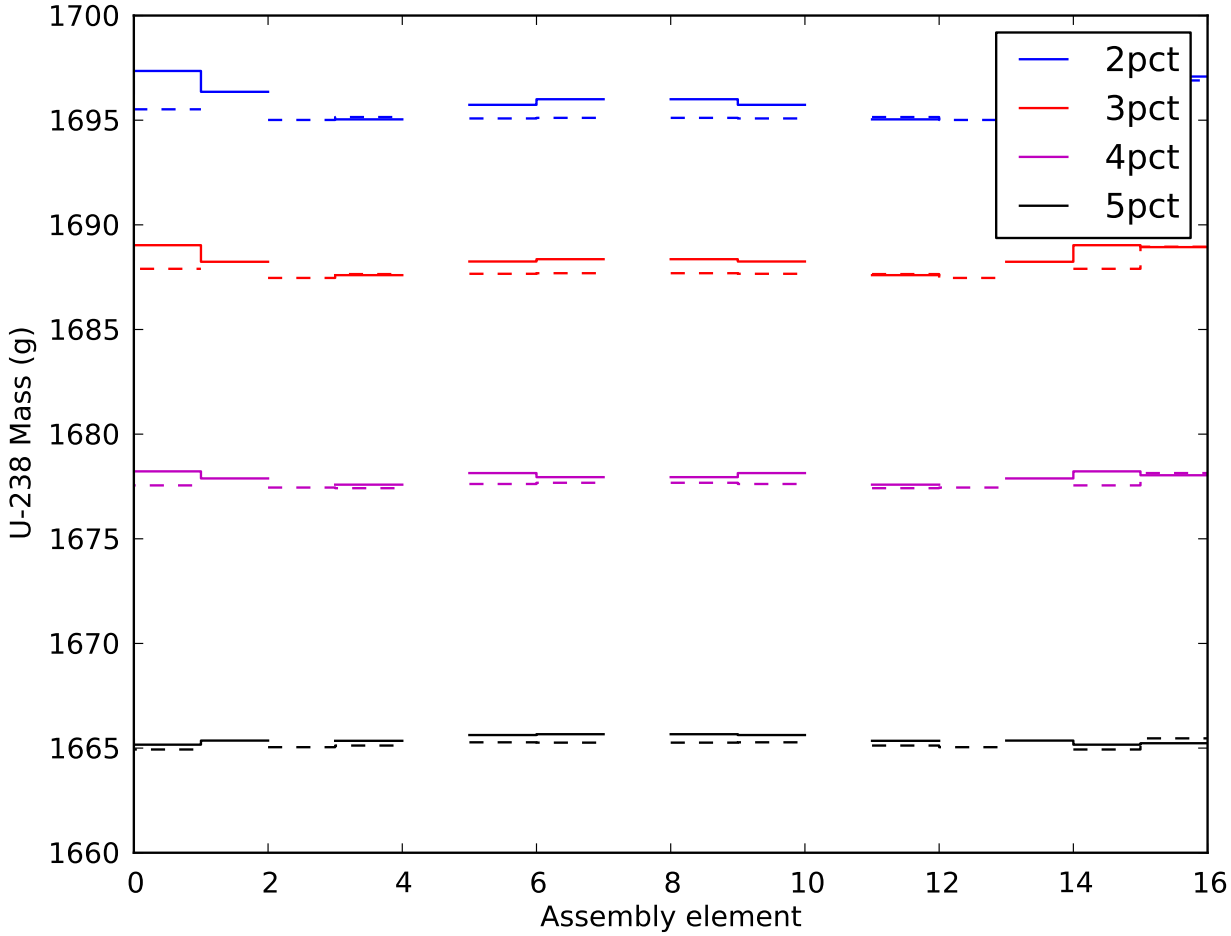
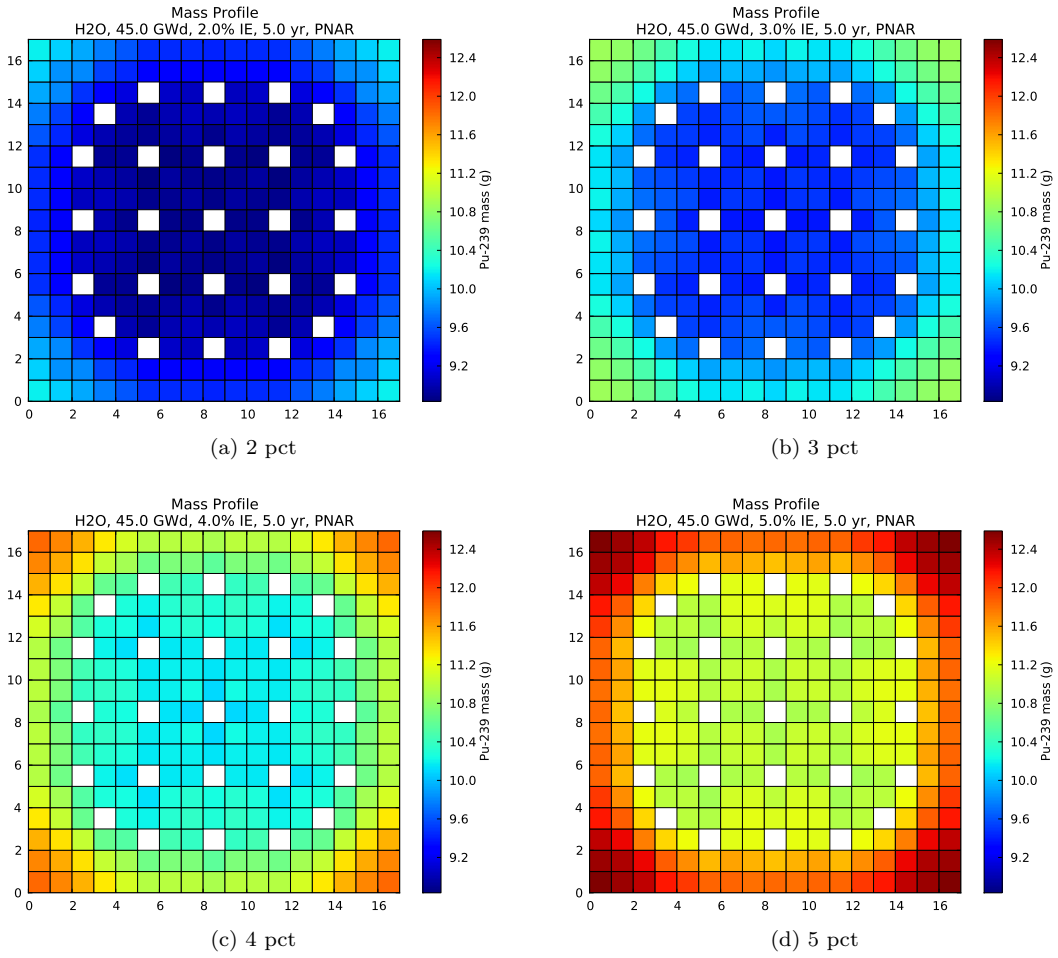


Figure 42: ^{238}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.4 Pu-239



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 43: Change in mass of ^{239}Pu with an increase in Enrichment.

Figure 43 shows the change in the mass of ^{239}Pu for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{239}Pu (3032 g) occurs when Enrichment is 5 pct, and the smallest mass (2446 g) occurs when Enrichment is 2 pct; the overall change in mass is 19.35 %. The change in the mass of ^{239}Pu in the individual assemblies is given in Table 150.

Parameter	min (location)	max (location)	% diff
2	8.8328 (-2, 3, 0)	10.1917 (-8, -8, 0)	13.33
3	9.3633 (-1, 0, 0)	10.8603 (-8, -8, 0)	13.78
4	10.1068 (-1, 0, 0)	11.8325 (-8, -8, 0)	14.58
5	10.9009 (4, -3, 0)	12.5897 (-8, -8, 0)	13.41

Table 150: The change in the mass of ^{239}Pu for each assembly shown in Figure 43. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{239}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

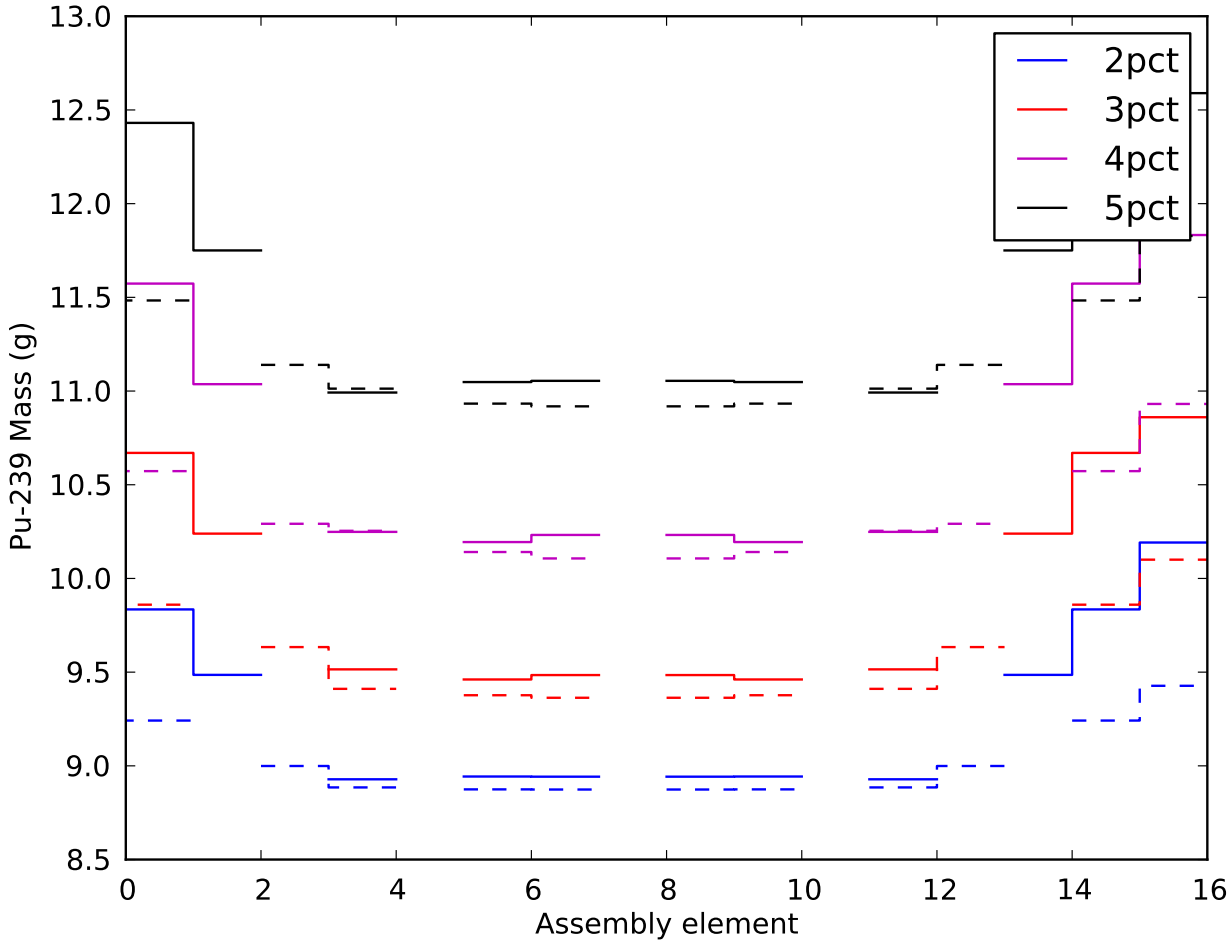
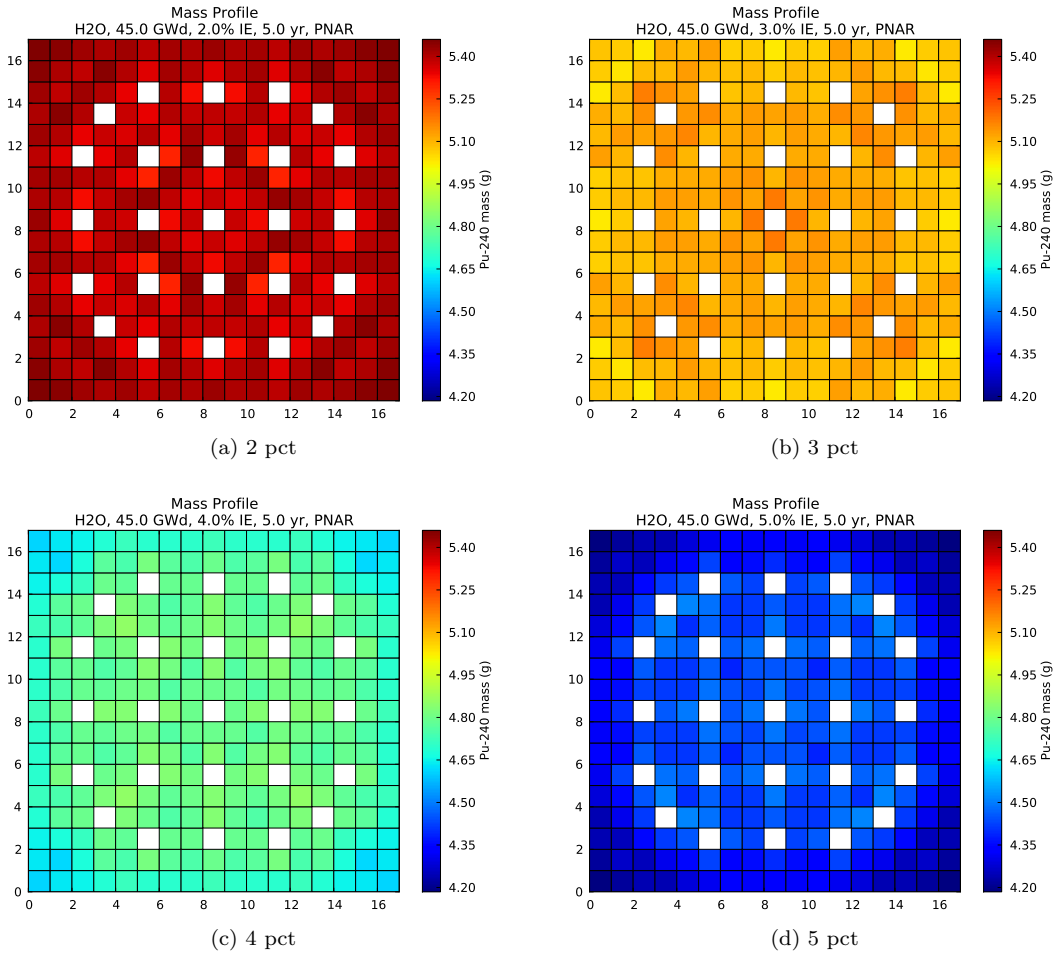


Figure 44: ^{239}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.5 Pu-240



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 45: Change in mass of ^{240}Pu with an increase in Enrichment.

Figure 45 shows the change in the mass of ^{240}Pu for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{240}Pu (1423 g) occurs when Enrichment is 2 pct, and the smallest mass (1157 g) occurs when Enrichment is 5 pct; the overall change in mass is 18.74 %. The change in the mass of ^{240}Pu in the individual assemblies is given in Table 151.

Parameter	min (location)	max (location)	% diff
2	5.2986 (-2, 3, 0)	5.4602 (-8, -8, 0)	2.96
3	5.0289 (-8, 0, 0)	5.1801 (-1, 0, 0)	2.92
4	4.6099 (-8, -8, 0)	4.8541 (-4, -4, 0)	5.03
5	4.1847 (-8, -8, 0)	4.5124 (4, -5, 0)	7.26

Table 151: The change in the mass of ^{240}Pu for each assembly shown in Figure 45. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{240}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

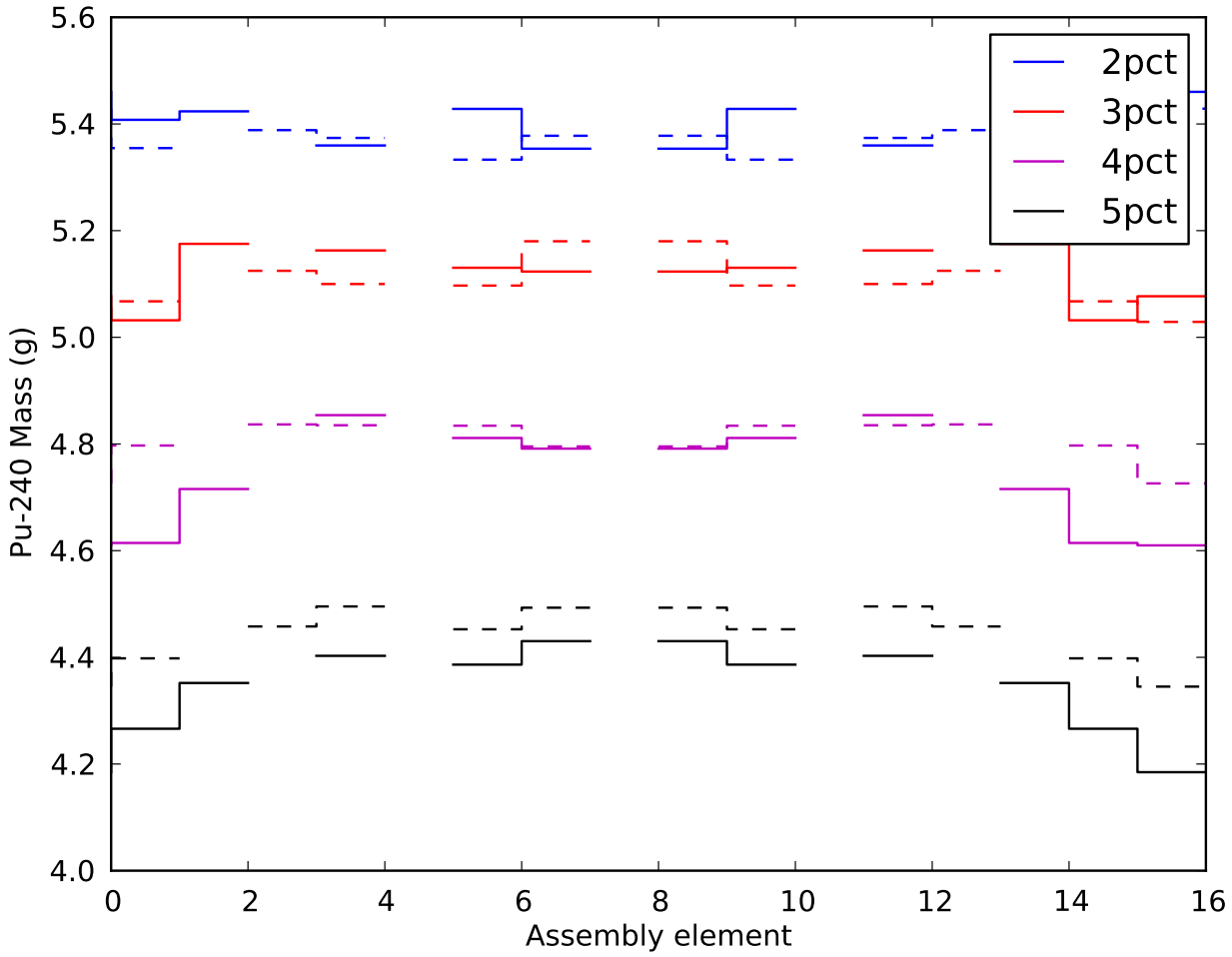
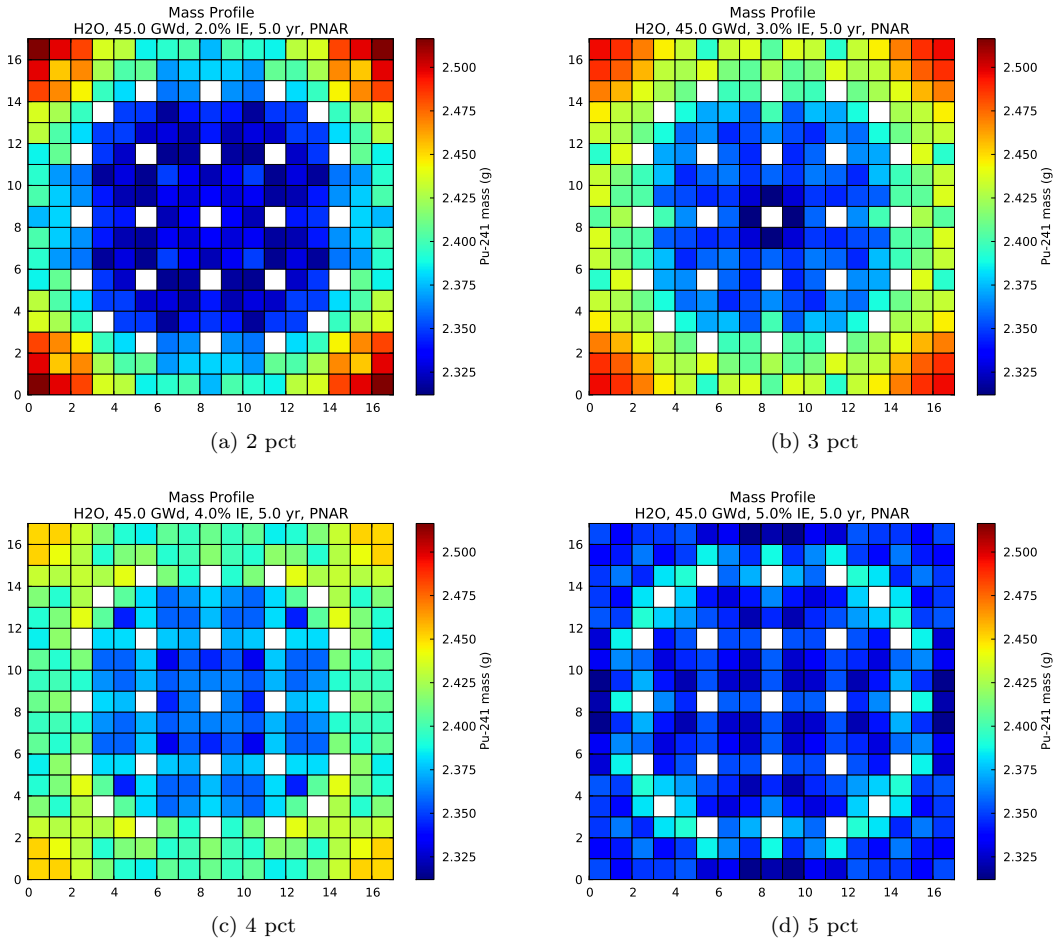


Figure 46: ^{240}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.6 Pu-241



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 47: Change in mass of ^{241}Pu with an increase in Enrichment.

Figure 47 shows the change in the mass of ^{241}Pu for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{241}Pu (634.2 g) occurs when Enrichment is 3 pct, and the smallest mass (620.5 g) occurs when Enrichment is 5 pct; the overall change in mass is 2.17 %. The change in the mass of ^{241}Pu in the individual assemblies is given in Table 152.

Parameter	min (location)	max (location)	% diff
2	2.3156 (-2, 3, 0)	2.5164 (-8, -8, 0)	7.98
3	2.3119 (-1, 0, 0)	2.4961 (-8, -8, 0)	7.38
4	2.3325 (2, -2, 0)	2.4523 (-7, -8, 0)	4.88
5	2.3150 (-8, -1, 0)	2.3922 (-4, 6, 0)	3.23

Table 152: The change in the mass of ^{241}Pu for each assembly shown in Figure 47. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

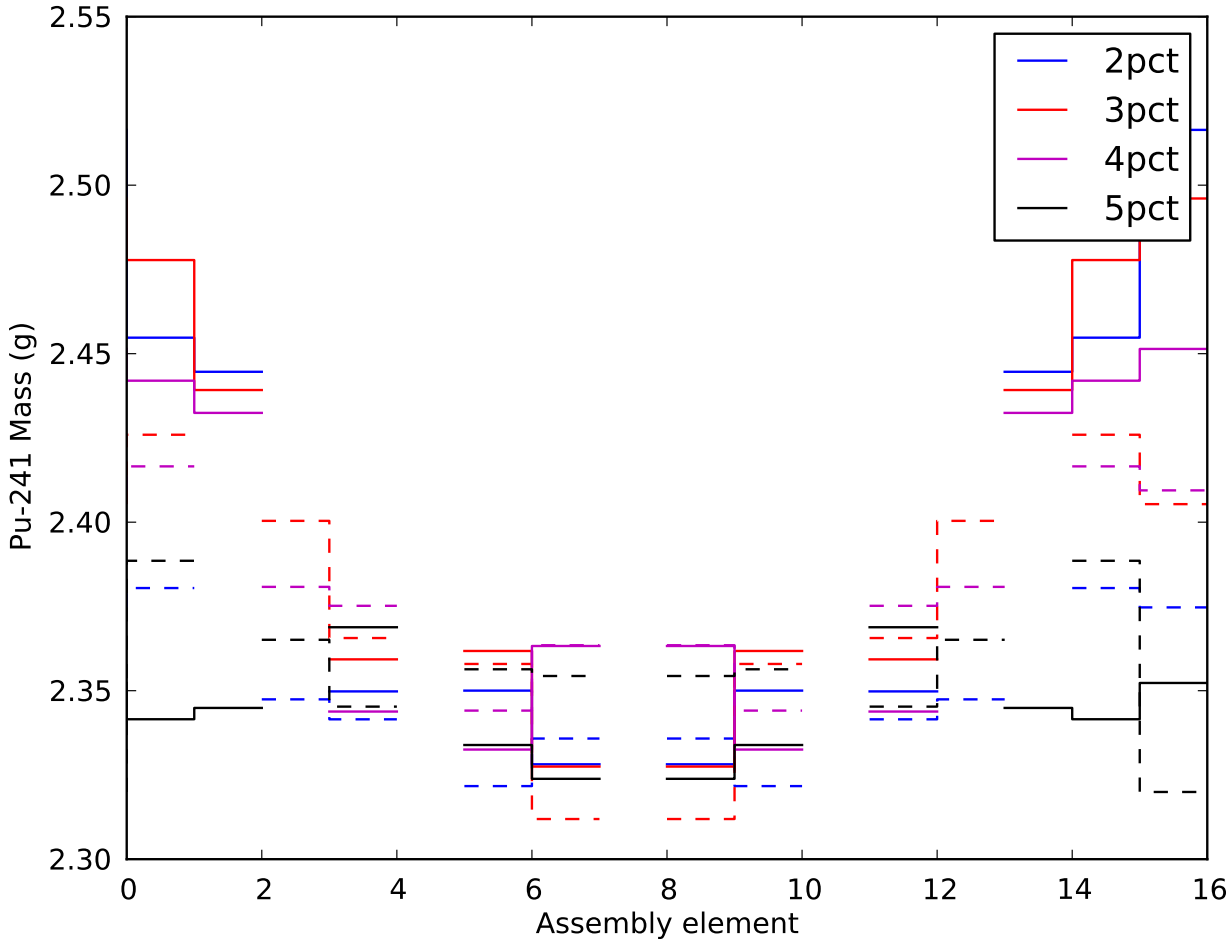
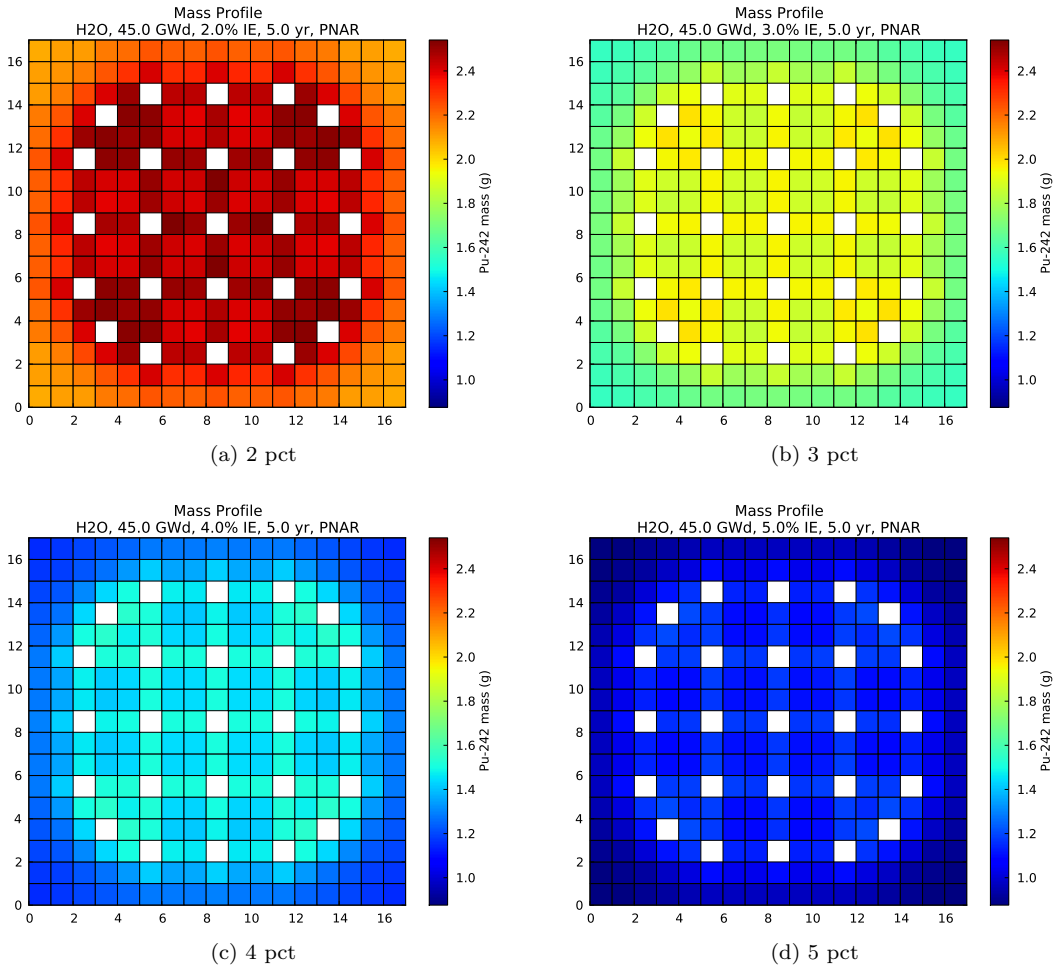


Figure 48: ^{241}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.7 Pu-242



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 49: Change in mass of ^{242}Pu with an increase in Enrichment.

Figure 49 shows the change in the mass of ^{242}Pu for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{242}Pu (621.2 g) occurs when Enrichment is 2 pct, and the smallest mass (280.7 g) occurs when Enrichment is 5 pct; the overall change in mass is 54.82 %. The change in the mass of ^{242}Pu in the individual assemblies is given in Table 153.

Parameter	min (location)	max (location)	% diff
2	2.0852 (-8, -8, 0)	2.5402 (2, 0, 0)	17.91
3	1.5666 (-8, -8, 0)	1.9891 (4, -5, 0)	21.24
4	1.1549 (-8, -8, 0)	1.5452 (4, -5, 0)	25.26
5	0.8756 (-8, -8, 0)	1.2048 (4, -5, 0)	27.32

Table 153: The change in the mass of ^{242}Pu for each assembly shown in Figure 49. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{242}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

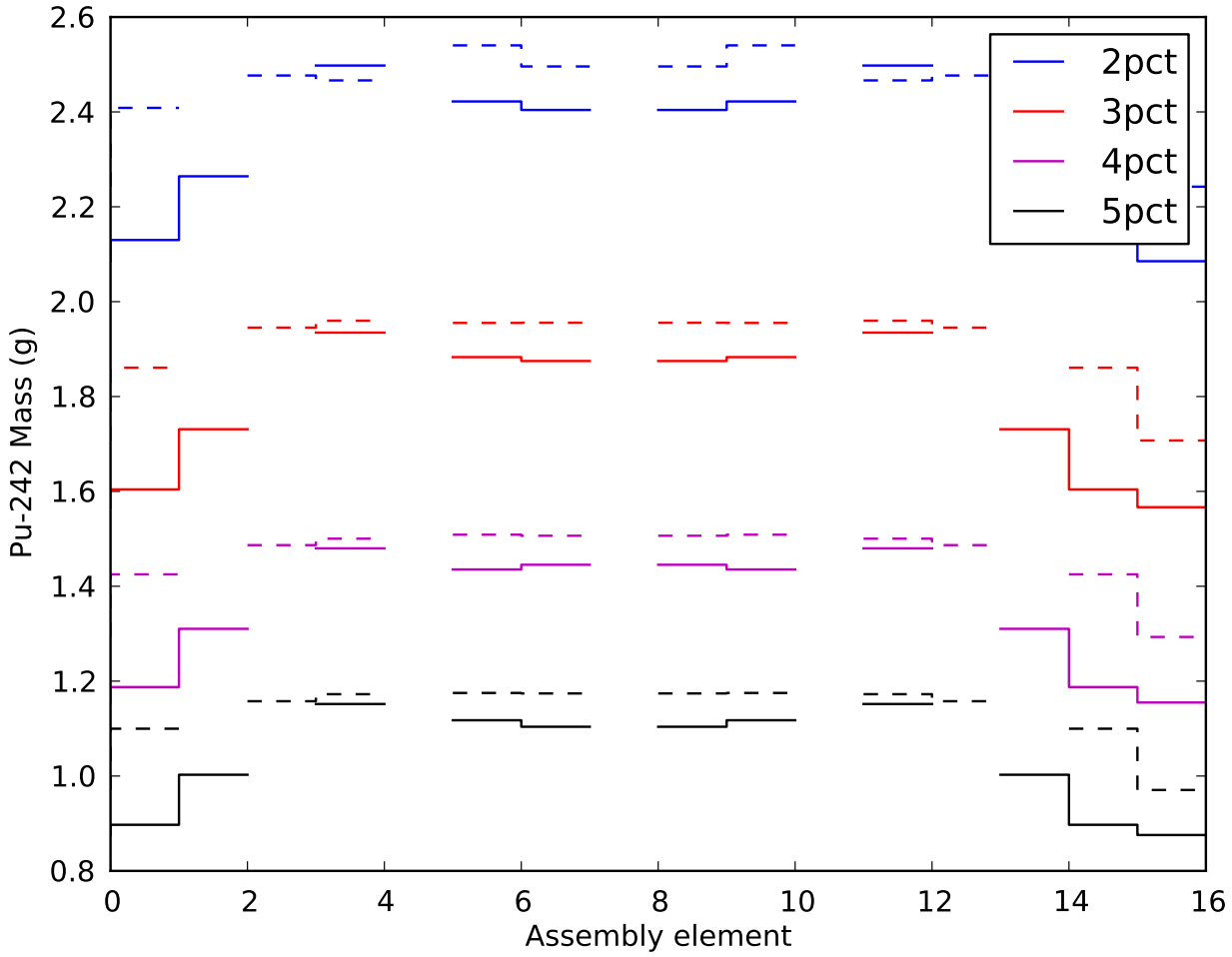
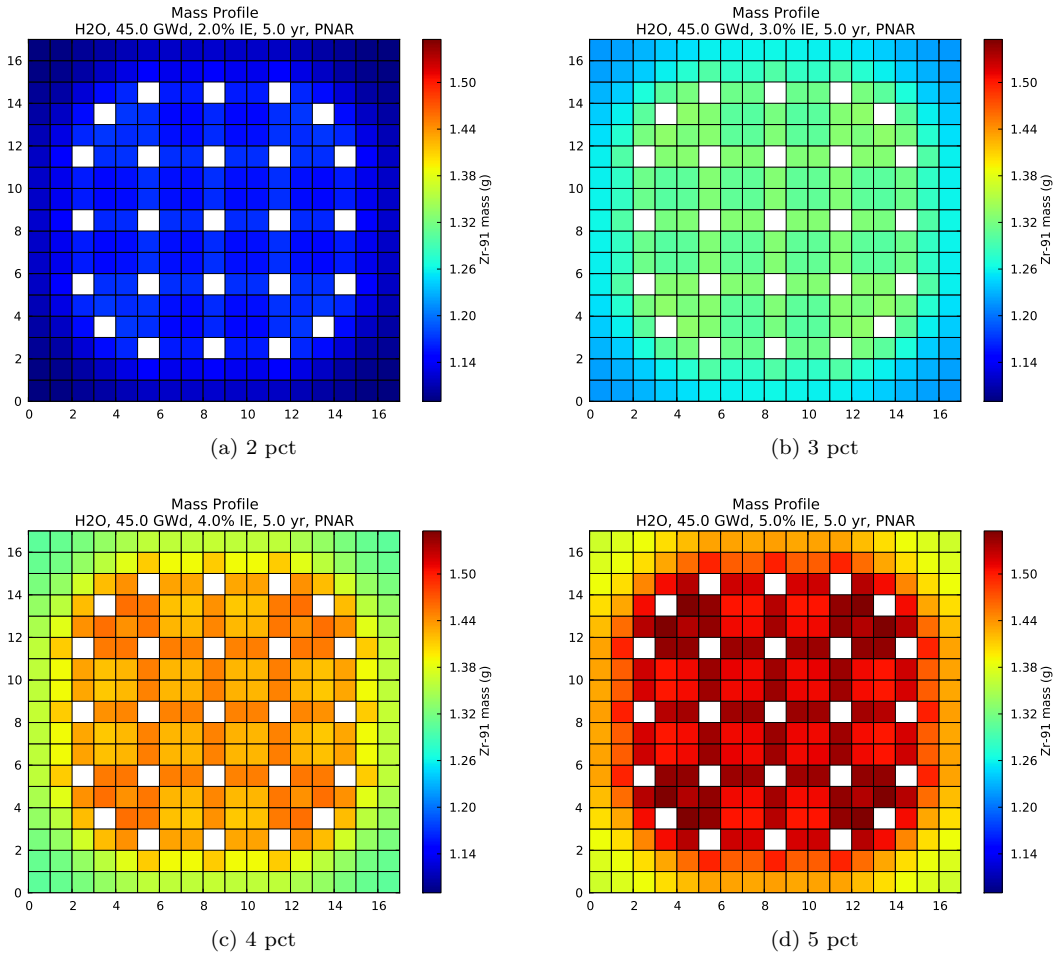


Figure 50: ^{242}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.8 Zr-91



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 51: Change in mass of ^{91}Zr with an increase in Enrichment.

Figure 51 shows the change in the mass of ^{91}Zr for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{91}Zr (391 g) occurs when Enrichment is 5 pct, and the smallest mass (301.2 g) occurs when Enrichment is 2 pct; the overall change in mass is 22.97 %. The change in the mass of ^{91}Zr in the individual assemblies is given in Table 154.

Parameter	min (location)	max (location)	% diff
2	1.0899 (-8, -8, 0)	1.1735 (4, -5, 0)	7.13
3	1.2183 (-8, -8, 0)	1.3320 (4, -5, 0)	8.54
4	1.3055 (-8, -8, 0)	1.4584 (4, -5, 0)	10.48
5	1.3687 (-8, -8, 0)	1.5554 (4, -5, 0)	12.01

Table 154: The change in the mass of ^{91}Zr for each assembly shown in Figure 51. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{91}Zr in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

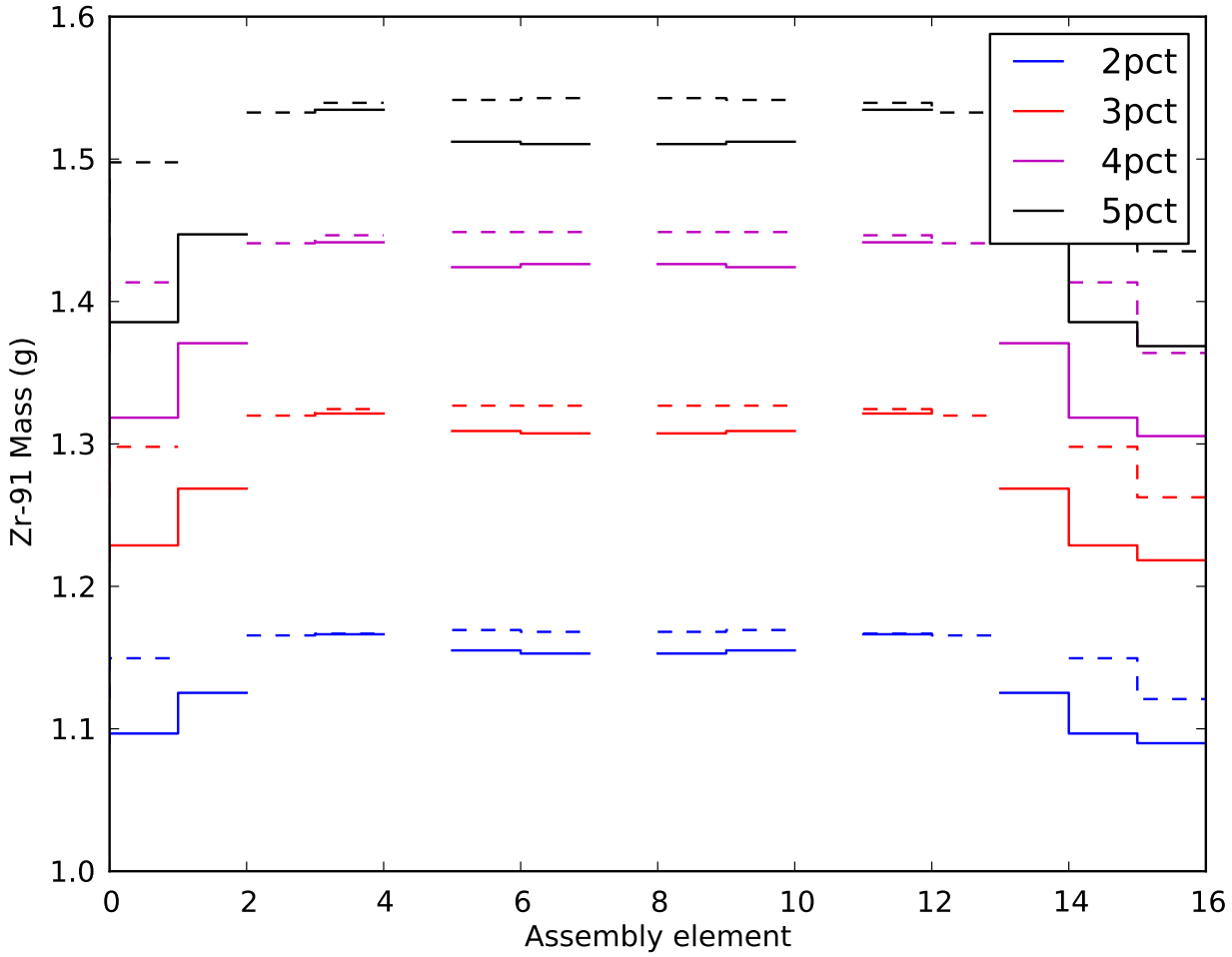
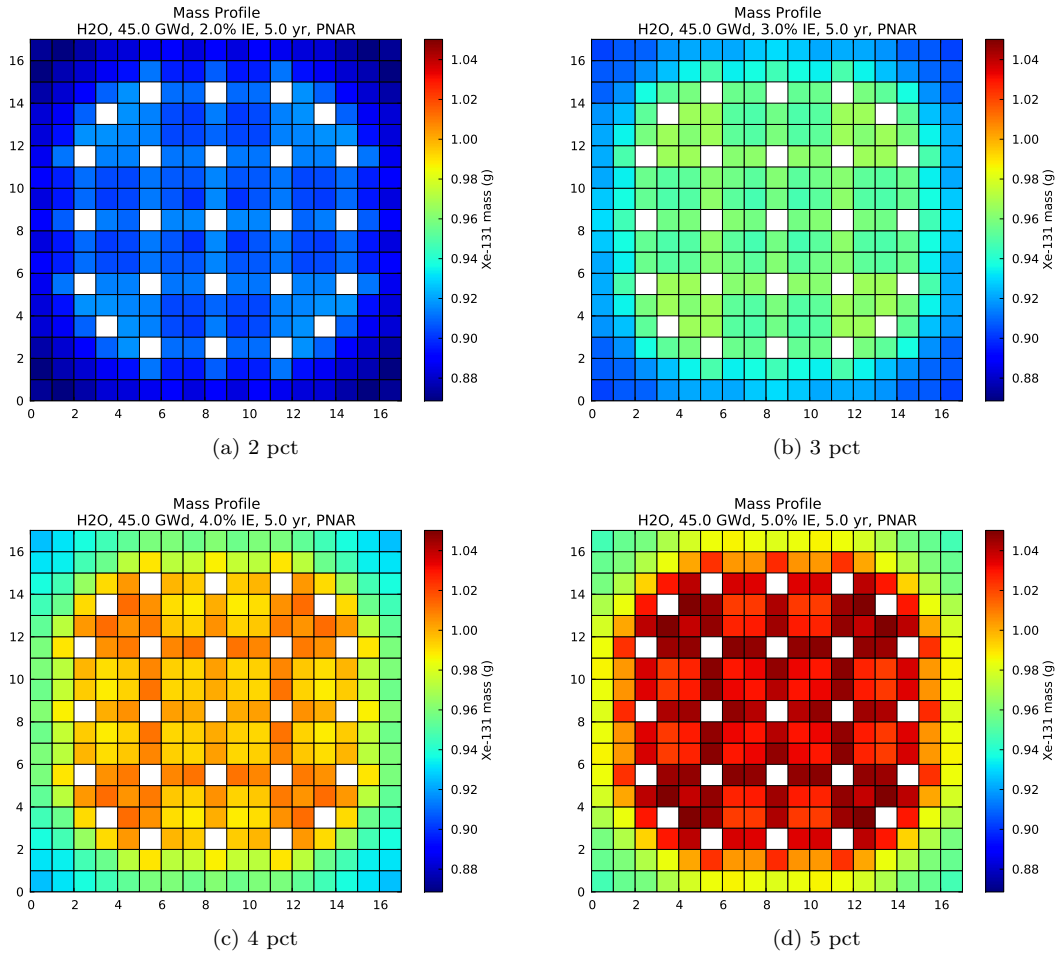


Figure 52: ^{91}Zr mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.9 Xe-131



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 53: Change in mass of ^{131}Xe with an increase in Enrichment.

Figure 53 shows the change in the mass of ^{131}Xe for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{131}Xe (267.3 g) occurs when Enrichment is 5 pct, and the smallest mass (237.4 g) occurs when Enrichment is 2 pct; the overall change in mass is 11.17 %. The change in the mass of ^{131}Xe in the individual assemblies is given in Table 155.

Parameter	min (location)	max (location)	% diff
2	0.8686 (-7, -8, 0)	0.9175 (4, -5, 0)	5.33
3	0.9029 (-8, -8, 0)	0.9671 (4, -5, 0)	6.63
4	0.9256 (-8, -8, 0)	1.0127 (4, -5, 0)	8.60
5	0.9471 (-8, -8, 0)	1.0502 (4, -5, 0)	9.82

Table 155: The change in the mass of ^{131}Xe for each assembly shown in Figure 53. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{131}Xe in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

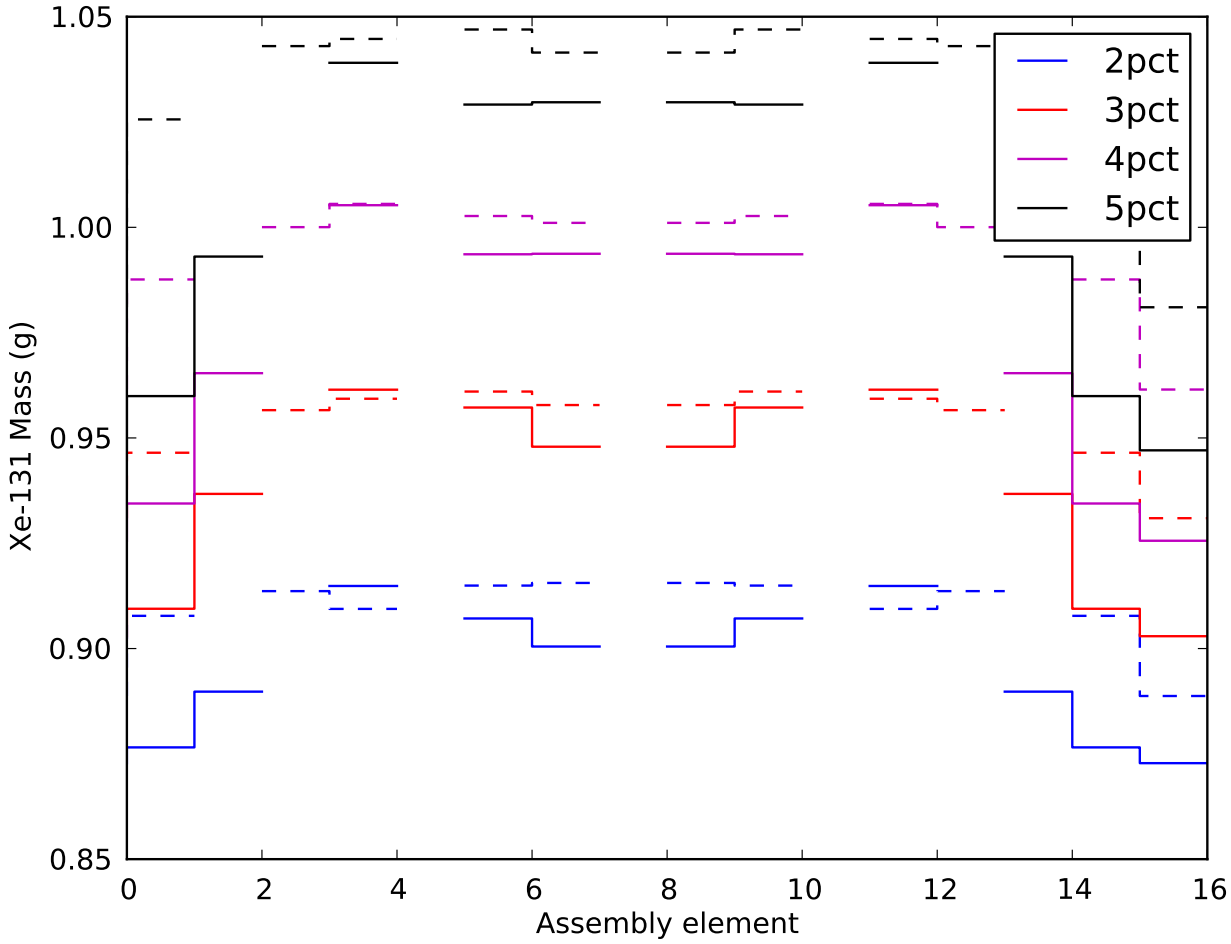
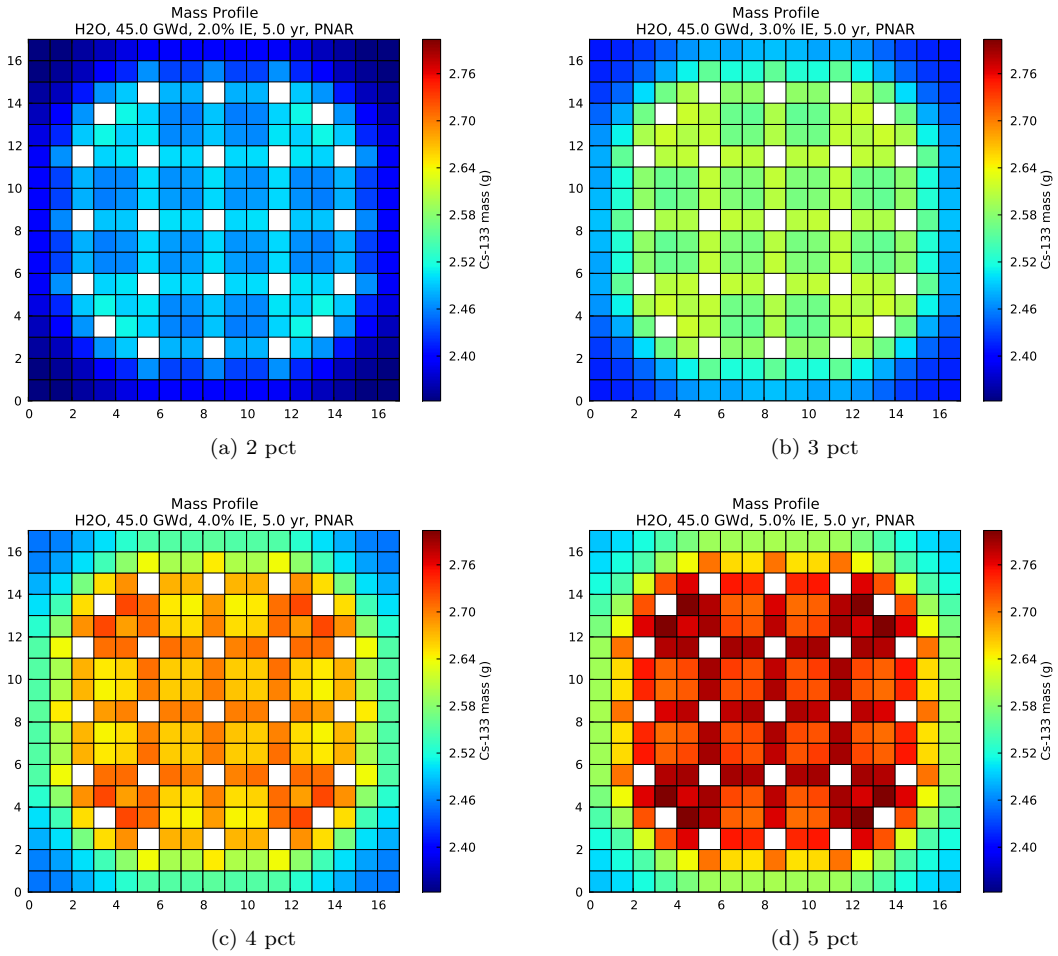


Figure 54: ^{131}Xe mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.10 Cs-133



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 55: Change in mass of ^{133}Cs with an increase in Enrichment.

Figure 55 shows the change in the mass of ^{133}Cs for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{133}Cs (706.9 g) occurs when Enrichment is 5 pct, and the smallest mass (644.7 g) occurs when Enrichment is 2 pct; the overall change in mass is 8.80 %. The change in the mass of ^{133}Cs in the individual assemblies is given in Table 156.

Parameter	min (location)	max (location)	% diff
2	2.3428 (-8, -8, 0)	2.5134 (4, -5, 0)	6.79
3	2.4105 (-8, -8, 0)	2.6165 (4, -5, 0)	7.88
4	2.4544 (-8, -8, 0)	2.7275 (4, -5, 0)	10.01
5	2.4891 (-8, -8, 0)	2.8038 (4, -5, 0)	11.22

Table 156: The change in the mass of ^{133}Cs for each assembly shown in Figure 55. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{133}Cs in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

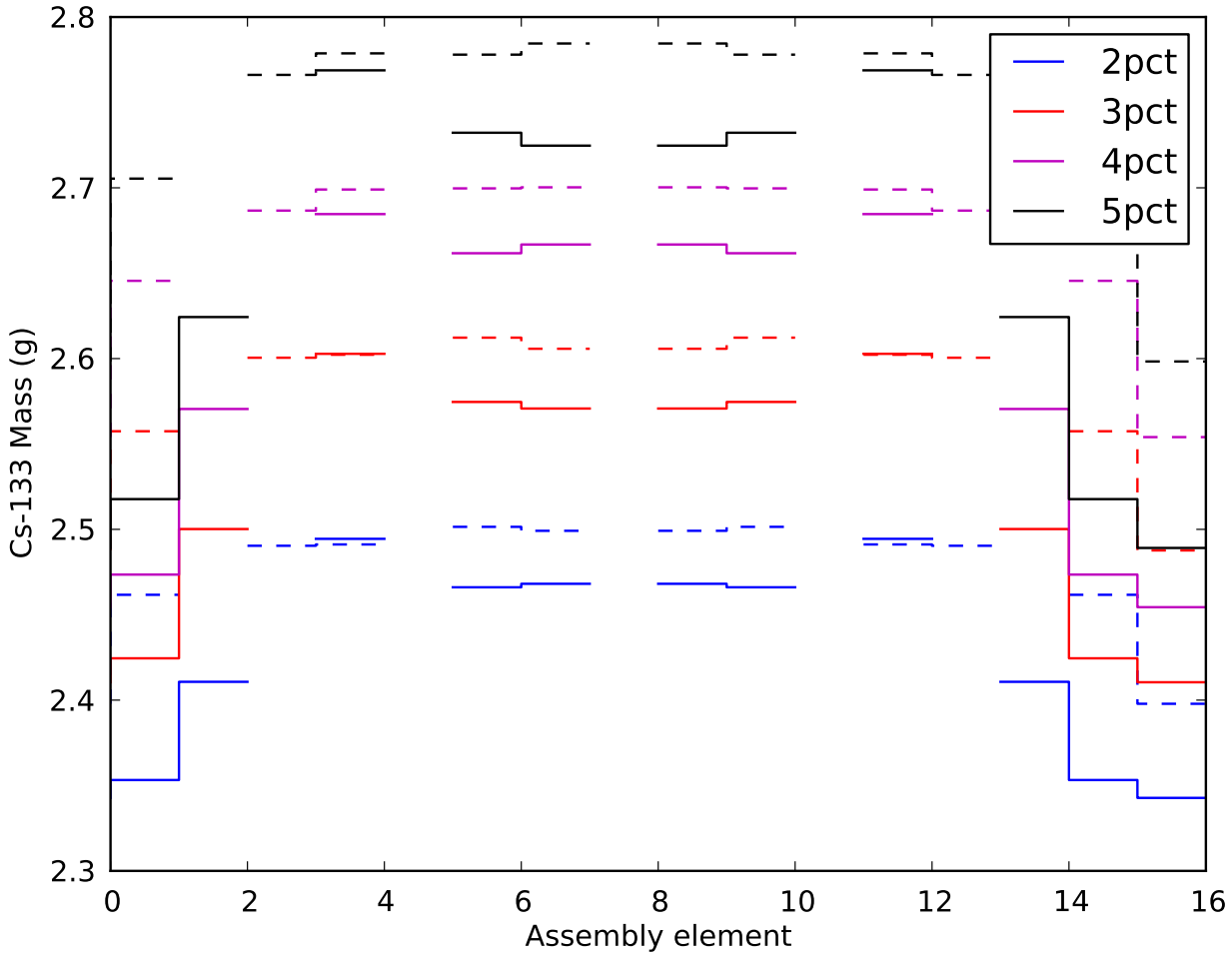
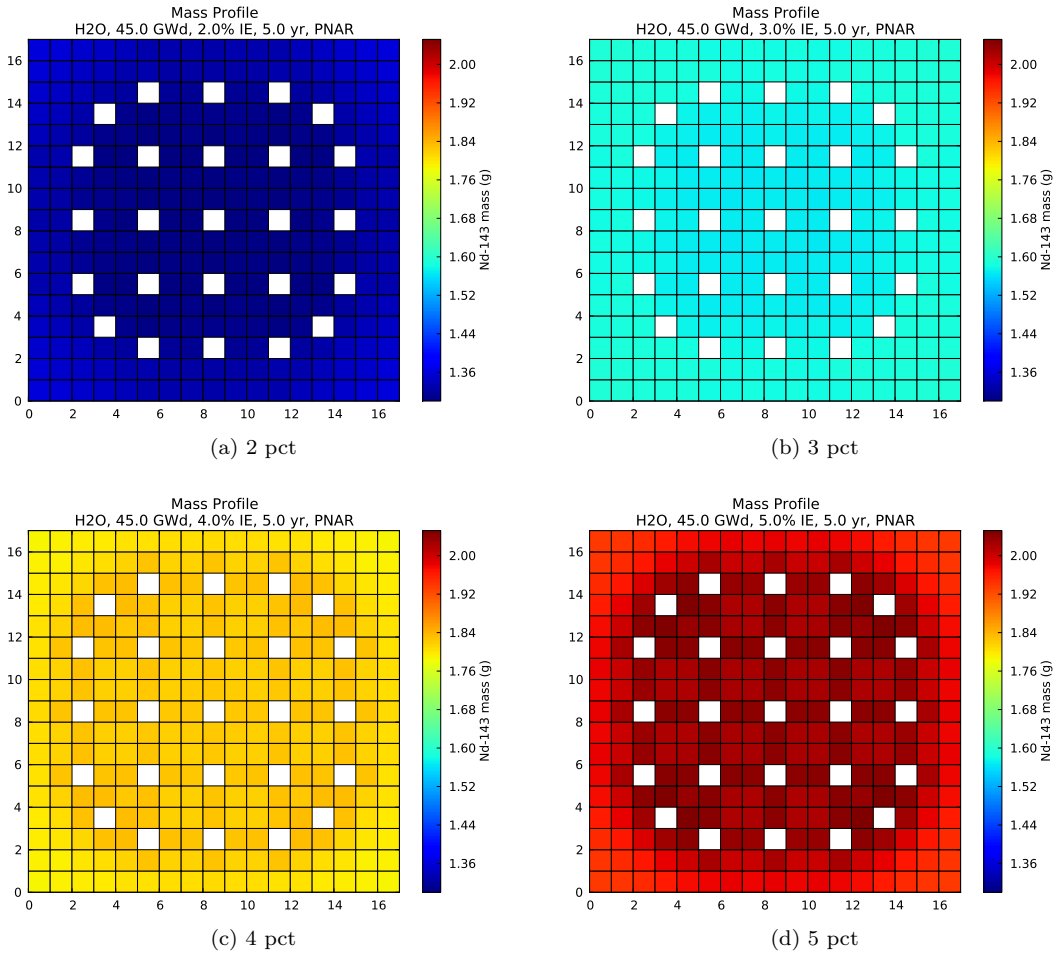


Figure 56: ^{133}Cs mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.11 Nd-143



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 57: Change in mass of ^{143}Nd with an increase in Enrichment.

Figure 57 shows the change in the mass of ^{143}Nd for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{143}Nd (530.4 g) occurs when Enrichment is 5 pct, and the smallest mass (349.1 g) occurs when Enrichment is 2 pct; the overall change in mass is 34.18 %. The change in the mass of ^{143}Nd in the individual assemblies is given in Table 157.

Parameter	min (location)	max (location)	% diff
2	1.3002 (-1, 0, 0)	1.3604 (-8, -8, 0)	4.43
3	1.5673 (1, 2, 0)	1.5939 (-8, -8, 0)	1.67
4	1.7881 (-8, -8, 0)	1.8342 (-4, 6, 0)	2.51
5	1.9390 (-8, -8, 0)	2.0521 (4, -5, 0)	5.51

Table 157: The change in the mass of ^{143}Nd for each assembly shown in Figure 57. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{143}Nd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

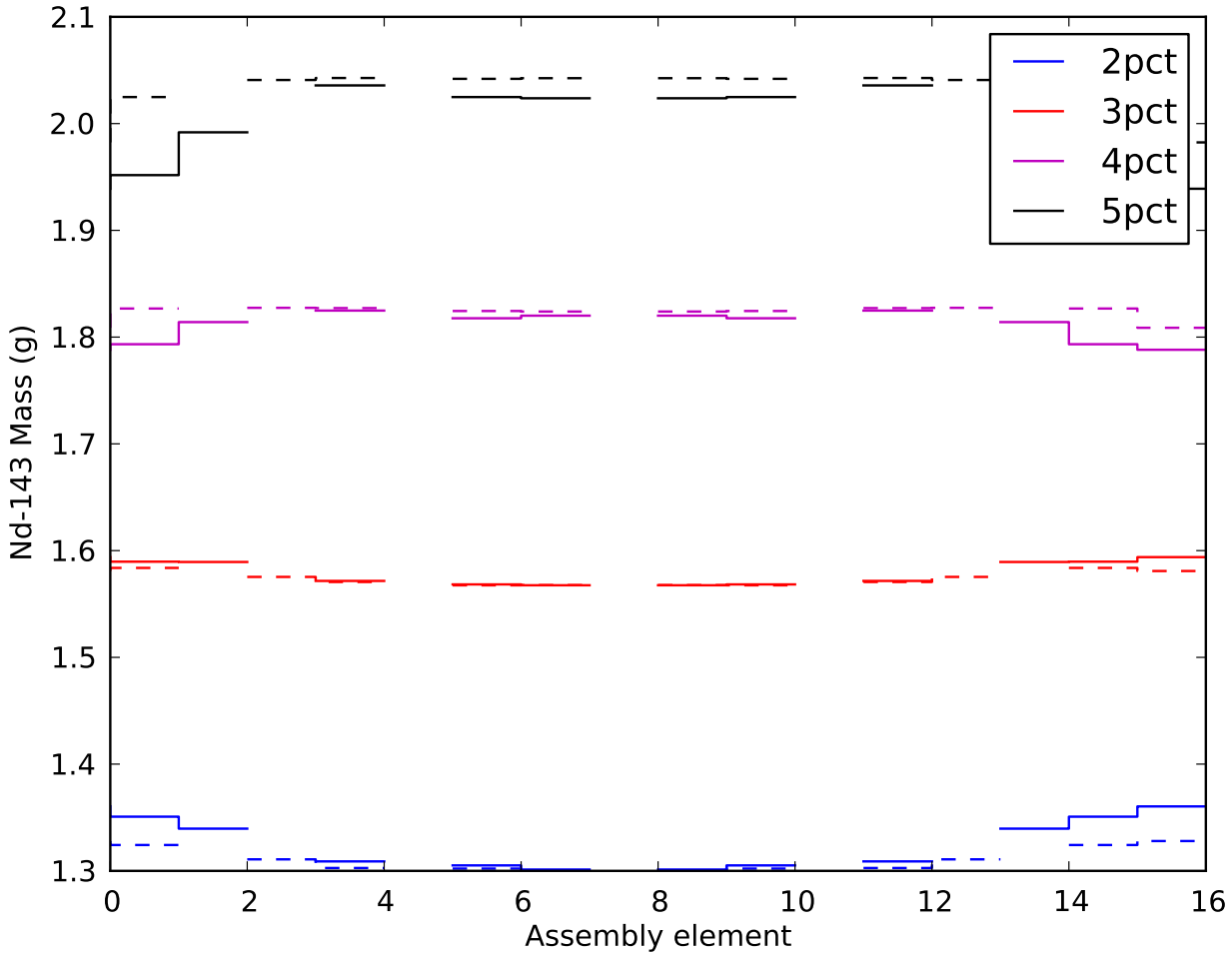
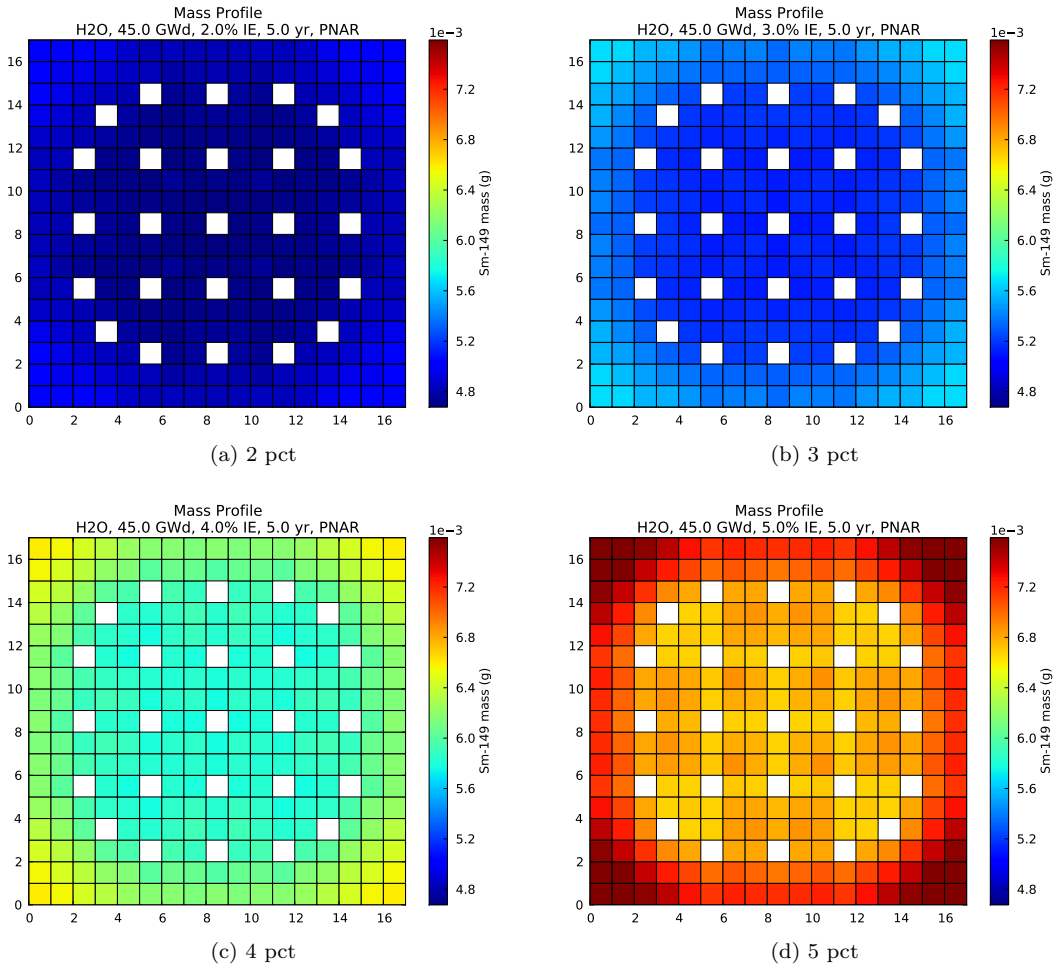


Figure 58: ^{143}Nd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.12 Sm-149



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 59: Change in mass of ^{149}Sm with an increase in Enrichment.

Figure 59 shows the change in the mass of ^{149}Sm for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{149}Sm (1.848 g) occurs when Enrichment is 5 pct, and the smallest mass (1.268 g) occurs when Enrichment is 2 pct; the overall change in mass is 31.41 %. The change in the mass of ^{149}Sm in the individual assemblies is given in Table 158.

Parameter	min (location)	max (location)	% diff
2	0.0047 (1, -1, 0)	0.0050 (-8, -8, 0)	7.37
3	0.0051 (-1, 0, 0)	0.0057 (-8, -8, 0)	10.07
4	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48
5	0.0067 (-1, 0, 0)	0.0076 (-7, 7, 0)	12.13

Table 158: The change in the mass of ^{149}Sm for each assembly shown in Figure 59. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{149}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

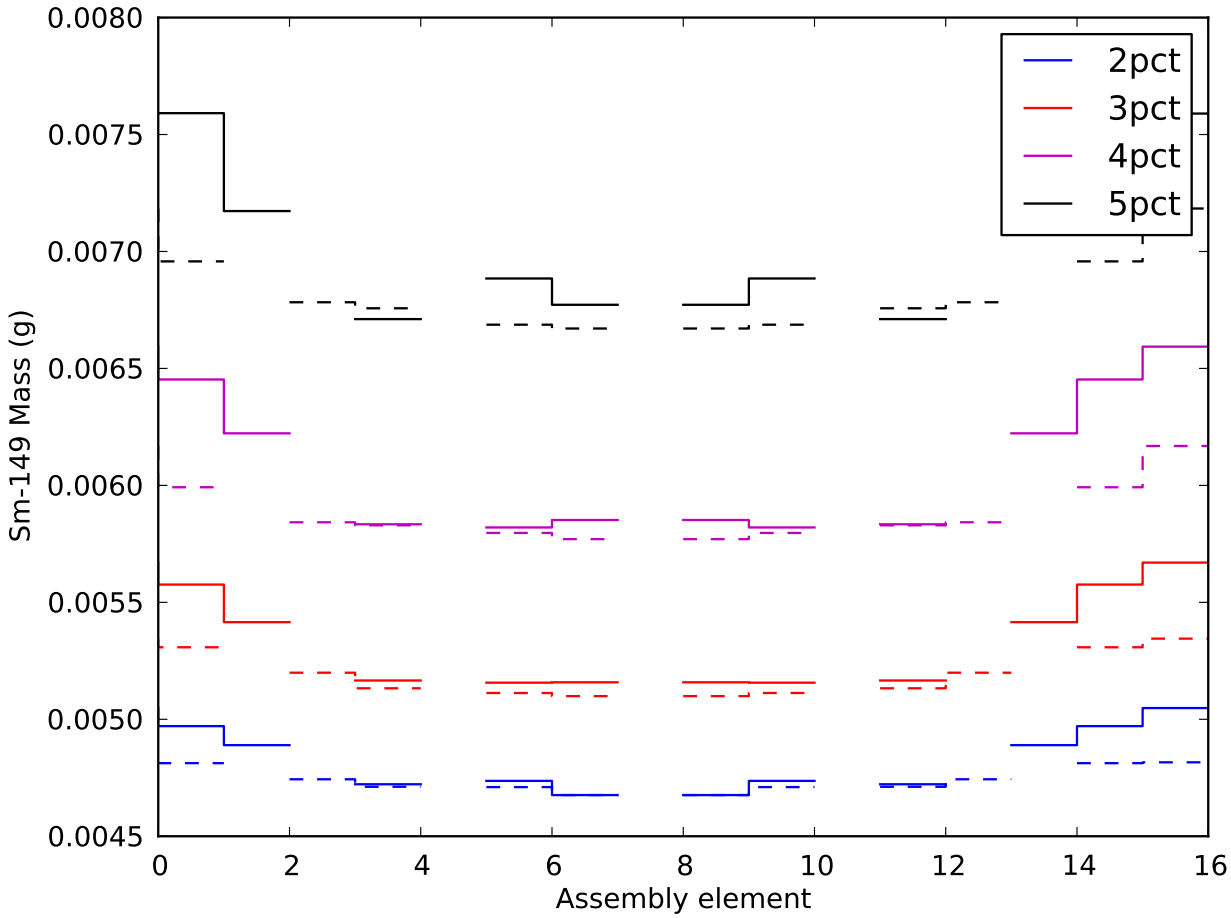
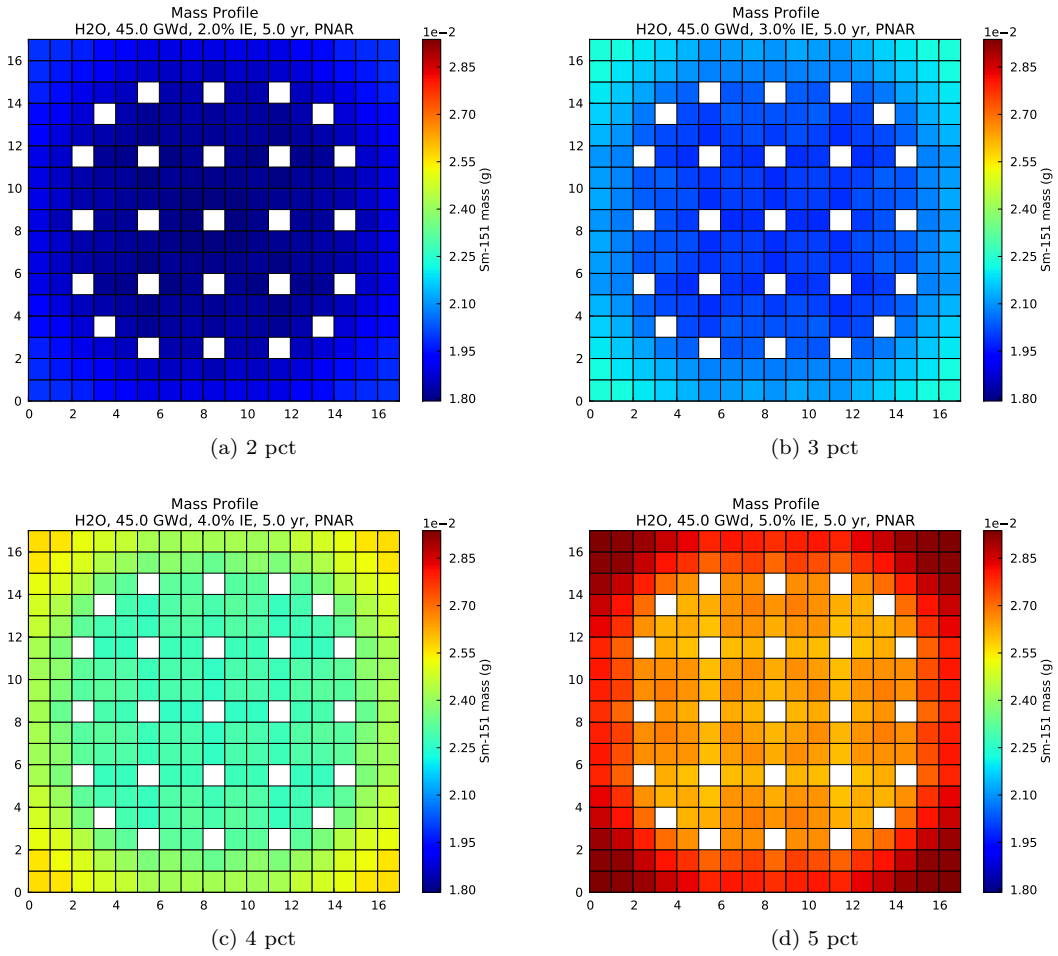


Figure 60: ^{149}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.13 Sm-151



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 61: Change in mass of ^{151}Sm with an increase in Enrichment.

Figure 61 shows the change in the mass of ^{151}Sm for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{151}Sm (7.194 g) occurs when Enrichment is 5 pct, and the smallest mass (4.927 g) occurs when Enrichment is 2 pct; the overall change in mass is 31.52 %. The change in the mass of ^{151}Sm in the individual assemblies is given in Table 159.

Parameter	min (location)	max (location)	% diff
2	0.0179 (-1, 0, 0)	0.0199 (-8, -8, 0)	10.03
3	0.0198 (2, 0, 0)	0.0223 (-8, -8, 0)	11.21
4	0.0226 (-1, 0, 0)	0.0256 (-8, -8, 0)	11.74
5	0.0260 (4, -3, 0)	0.0294 (-8, -8, 0)	11.51

Table 159: The change in the mass of ^{151}Sm for each assembly shown in Figure 61. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{151}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

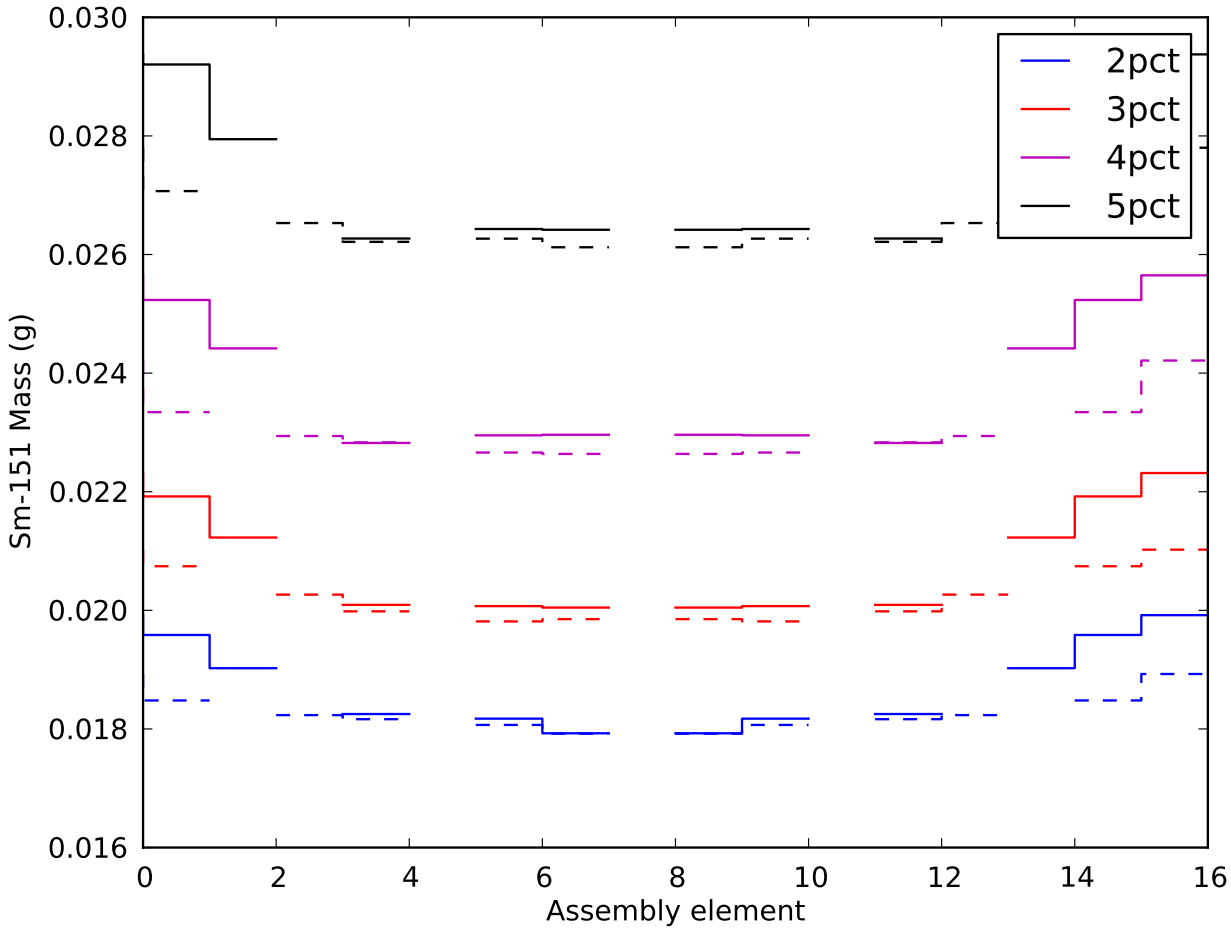
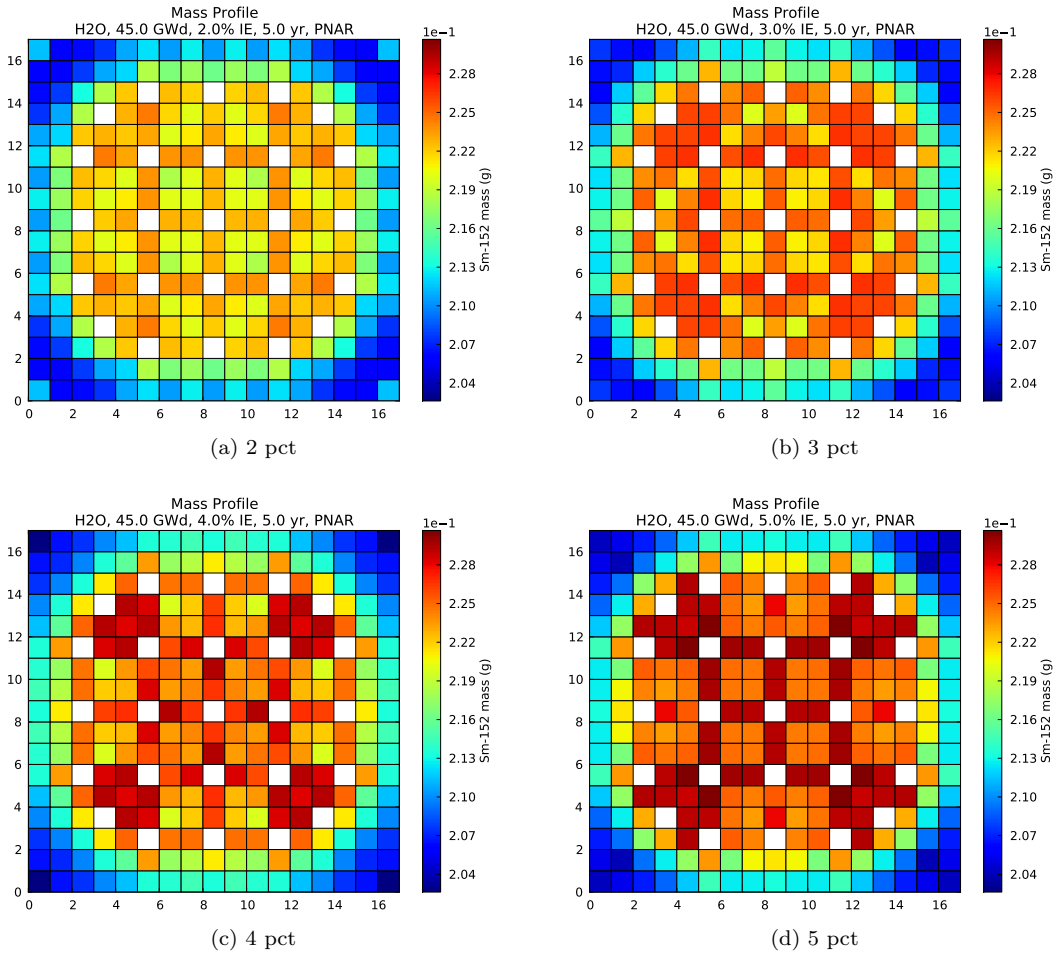


Figure 62: ^{151}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.14 Sm-152



(a) 2 pct (b) 3 pct

(c) 4 pct (d) 5 pct

Figure 63: Change in mass of ^{152}Sm with an increase in Enrichment.

Figure 63 shows the change in the mass of ^{152}Sm for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{152}Sm (58.17 g) occurs when Enrichment is 5 pct, and the smallest mass (57.28 g) occurs when Enrichment is 2 pct; the overall change in mass is 1.53 %. The change in the mass of ^{152}Sm in the individual assemblies is given in Table 160.

Parameter	min (location)	max (location)	% diff
2	0.2058 (-7, -8, 0)	0.2245 (-5, 3, 0)	8.34
3	0.2062 (6, -8, 0)	0.2267 (3, 1, 0)	9.05
4	0.2026 (-8, -8, 0)	0.2294 (2, 0, 0)	11.69
5	0.2040 (-7, 7, 0)	0.2307 (4, -3, 0)	11.56

Table 160: The change in the mass of ^{152}Sm for each assembly shown in Figure 63. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{152}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

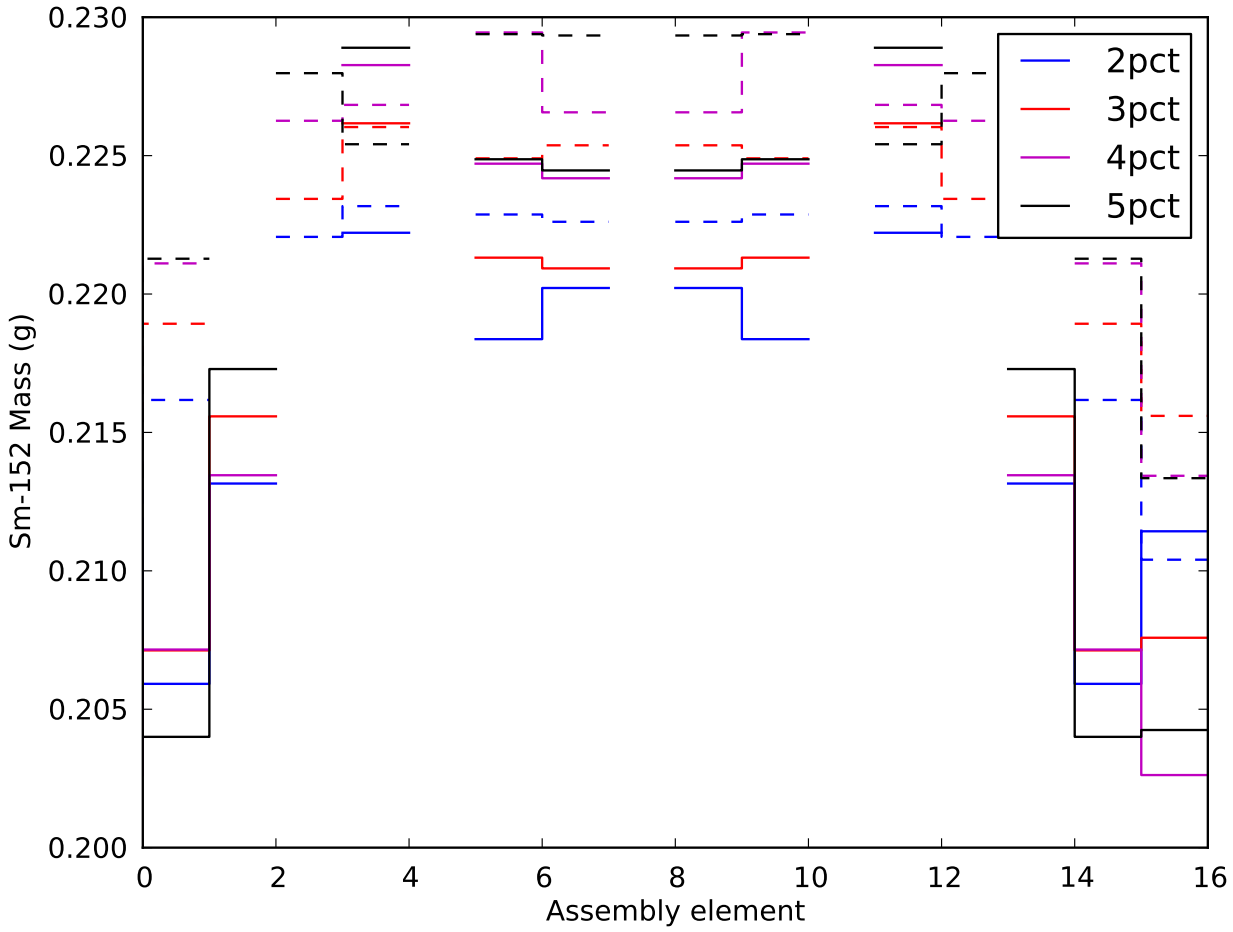
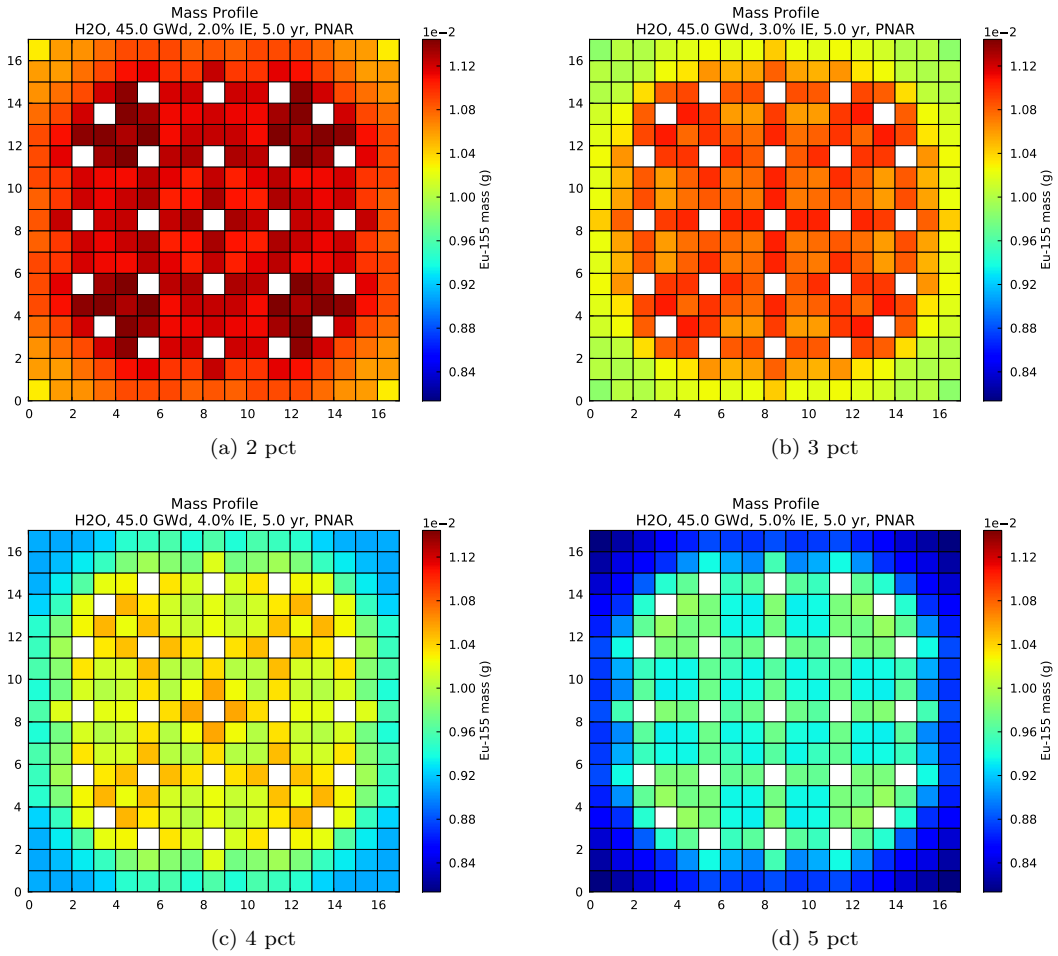


Figure 64: ^{152}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.15 Eu-155



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 65: Change in mass of ^{155}Eu with an increase in Enrichment.

Figure 65 shows the change in the mass of ^{155}Eu for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{155}Eu (2.919 g) occurs when Enrichment is 2 pct, and the smallest mass (2.427 g) occurs when Enrichment is 5 pct; the overall change in mass is 16.86 %. The change in the mass of ^{155}Eu in the individual assemblies is given in Table 161.

Parameter	min (location)	max (location)	% diff
2	0.0103 (-8, -8, 0)	0.0114 (4, -3, 0)	9.92
3	0.0099 (-8, -8, 0)	0.0110 (4, -5, 0)	10.75
4	0.0091 (-7, -8, 0)	0.0106 (-1, 0, 0)	13.85
5	0.0081 (-8, -8, 0)	0.0099 (4, -5, 0)	17.83

Table 161: The change in the mass of ^{155}Eu for each assembly shown in Figure 65. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Eu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

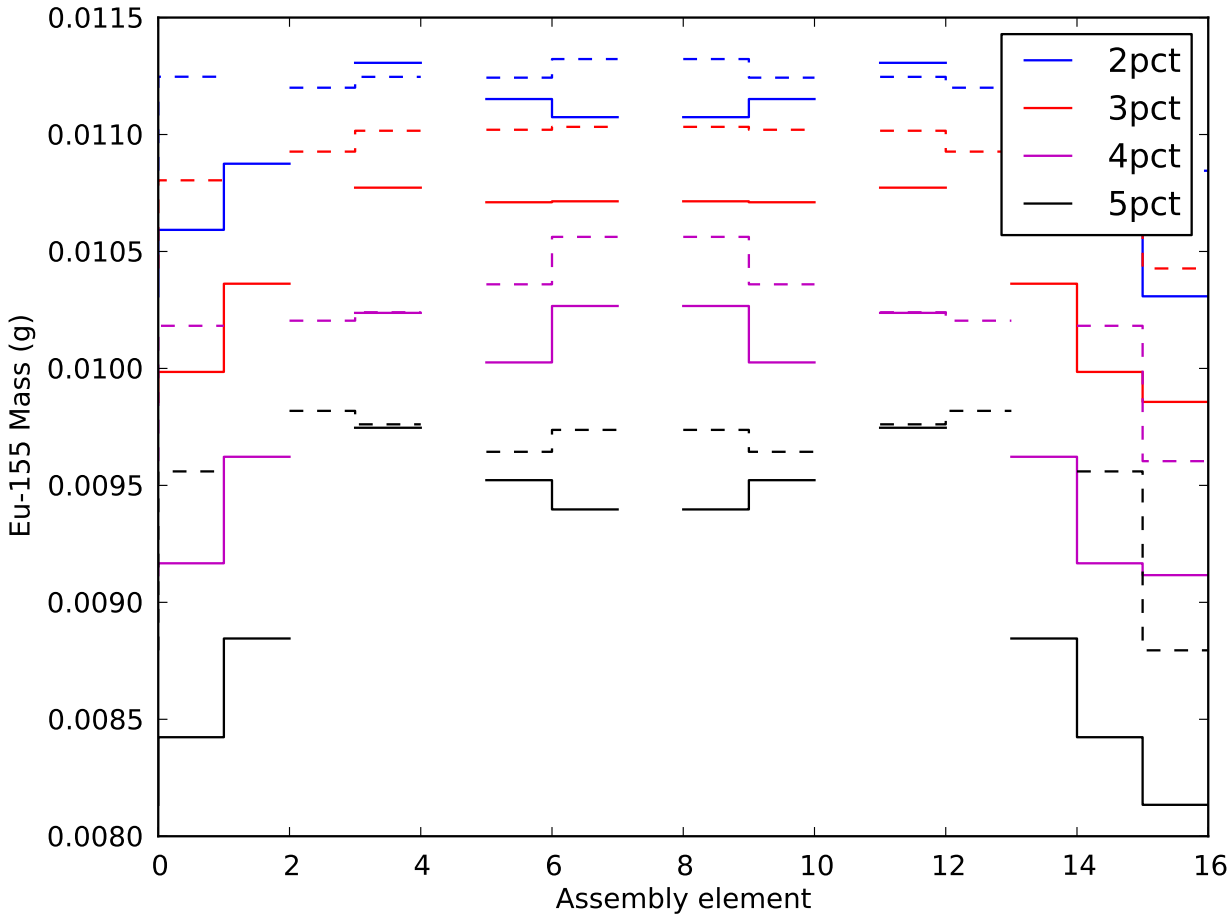
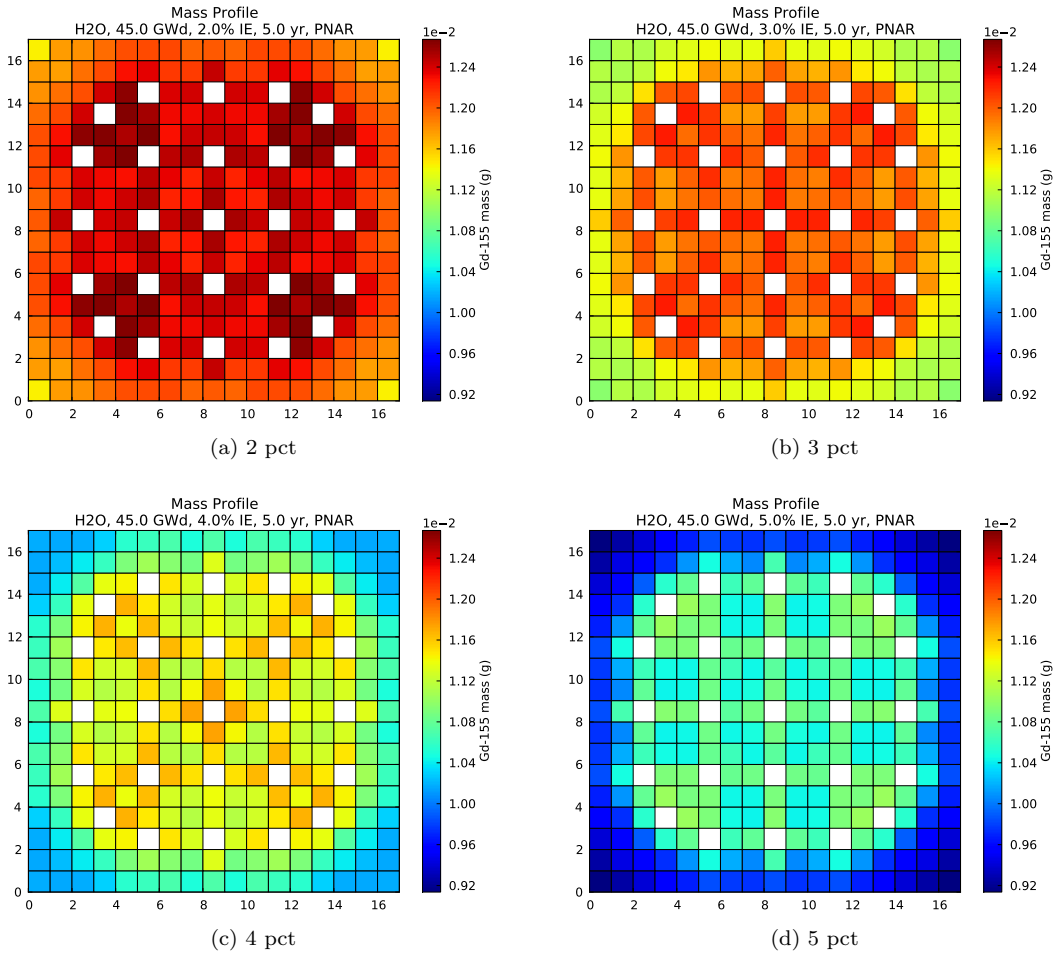


Figure 66: ^{155}Eu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.16 Gd-155



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 67: Change in mass of ^{155}Gd with an increase in Enrichment.

Figure 67 shows the change in the mass of ^{155}Gd for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{155}Gd (3.234 g) occurs when Enrichment is 2 pct, and the smallest mass (2.713 g) occurs when Enrichment is 5 pct; the overall change in mass is 16.12 %. The change in the mass of ^{155}Gd in the individual assemblies is given in Table 162.

Parameter	min (location)	max (location)	% diff
2	0.0114 (-8, -8, 0)	0.0127 (4, -3, 0)	9.67
3	0.0110 (-8, -8, 0)	0.0122 (4, -5, 0)	10.40
4	0.0102 (-7, -8, 0)	0.0117 (-1, 0, 0)	13.44
5	0.0091 (-8, -8, 0)	0.0110 (4, -5, 0)	17.22

Table 162: The change in the mass of ^{155}Gd for each assembly shown in Figure 67. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Gd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

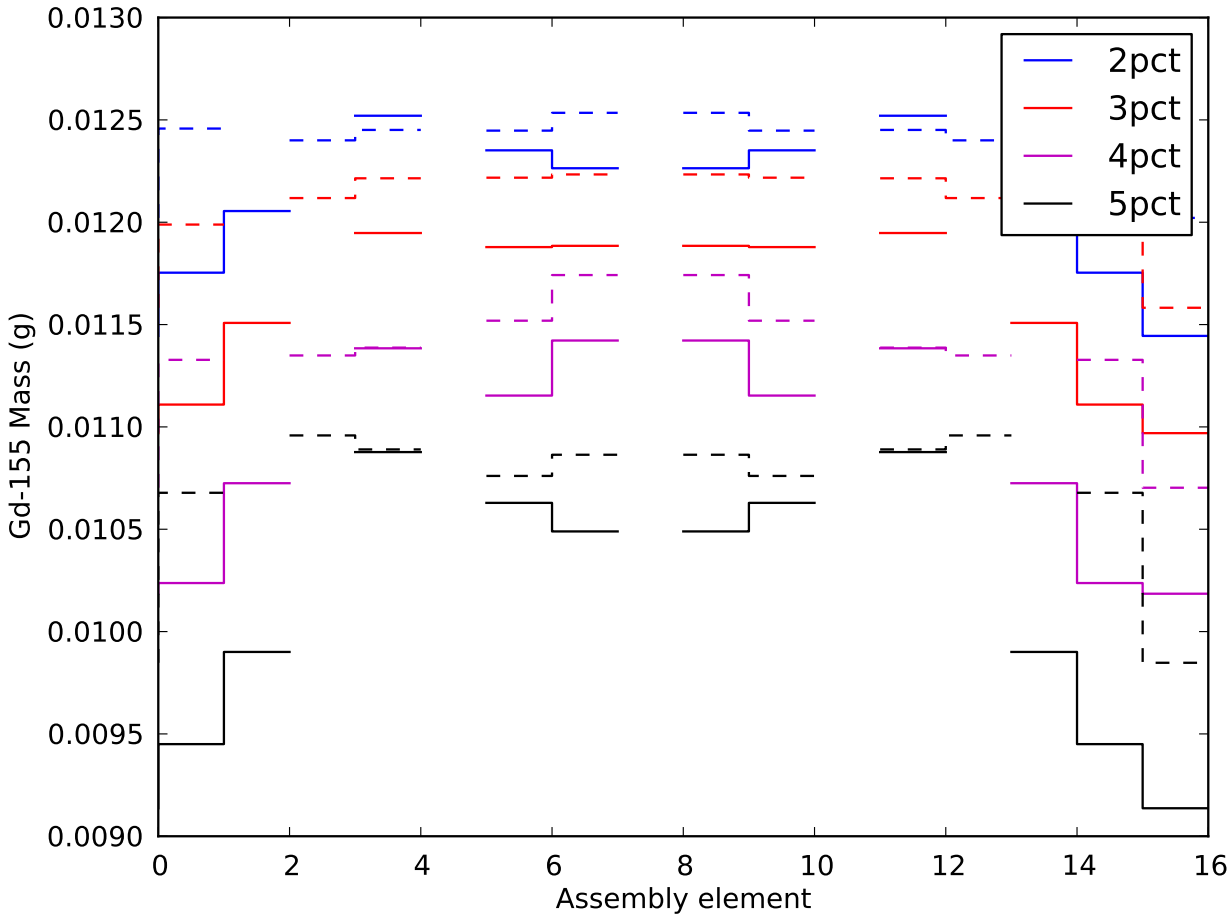
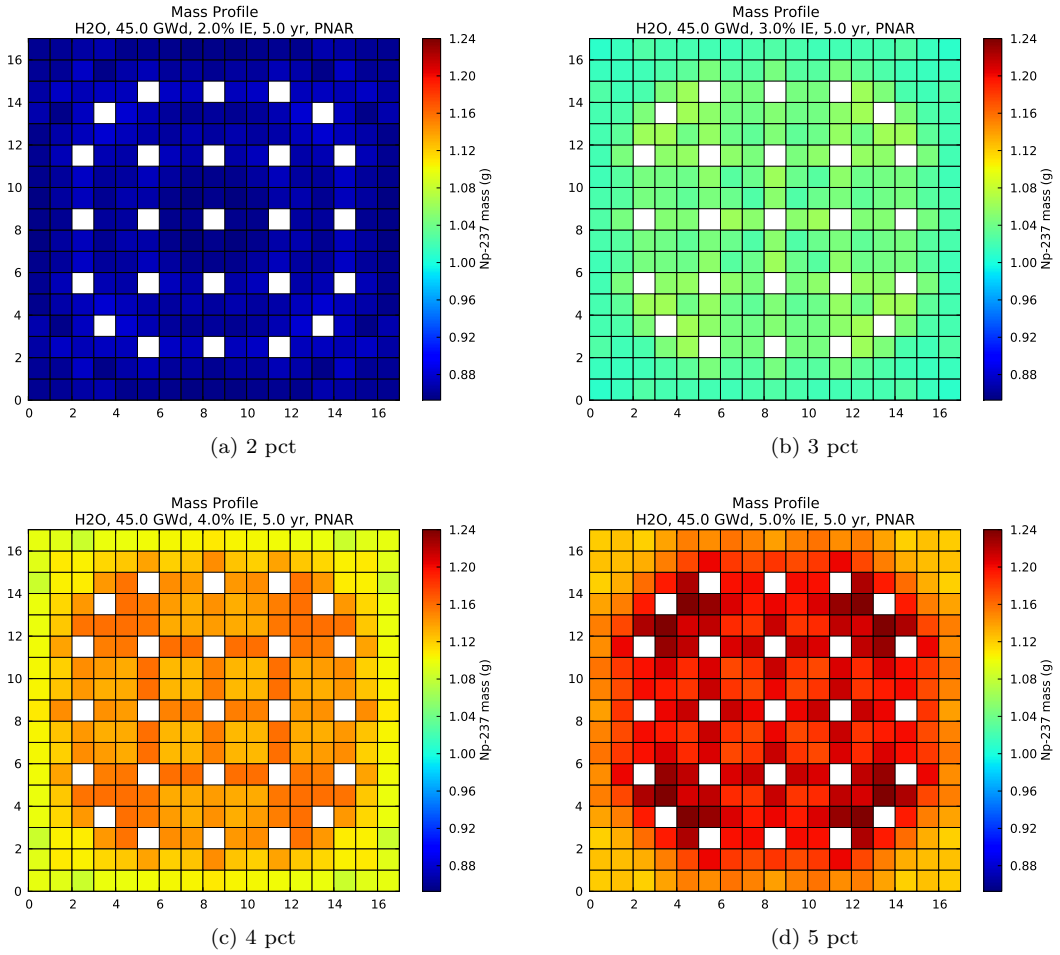


Figure 68: ^{155}Gd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.17 Np-237



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 69: Change in mass of ^{237}Np with an increase in Enrichment.

Figure 69 shows the change in the mass of ^{237}Np for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{237}Np (311.7 g) occurs when Enrichment is 5 pct, and the smallest mass (228.5 g) occurs when Enrichment is 2 pct; the overall change in mass is 26.71 %. The change in the mass of ^{237}Np in the individual assemblies is given in Table 163.

Parameter	min (location)	max (location)	% diff
2	0.8526 (1, -1, 0)	0.8807 (4, -5, 0)	3.19
3	1.0093 (-8, -8, 0)	1.0643 (4, -5, 0)	5.18
4	1.0828 (6, -8, 0)	1.1596 (4, -5, 0)	6.62
5	1.1195 (6, -8, 0)	1.2400 (4, -5, 0)	9.71

Table 163: The change in the mass of ^{237}Np for each assembly shown in Figure 69. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{237}Np in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

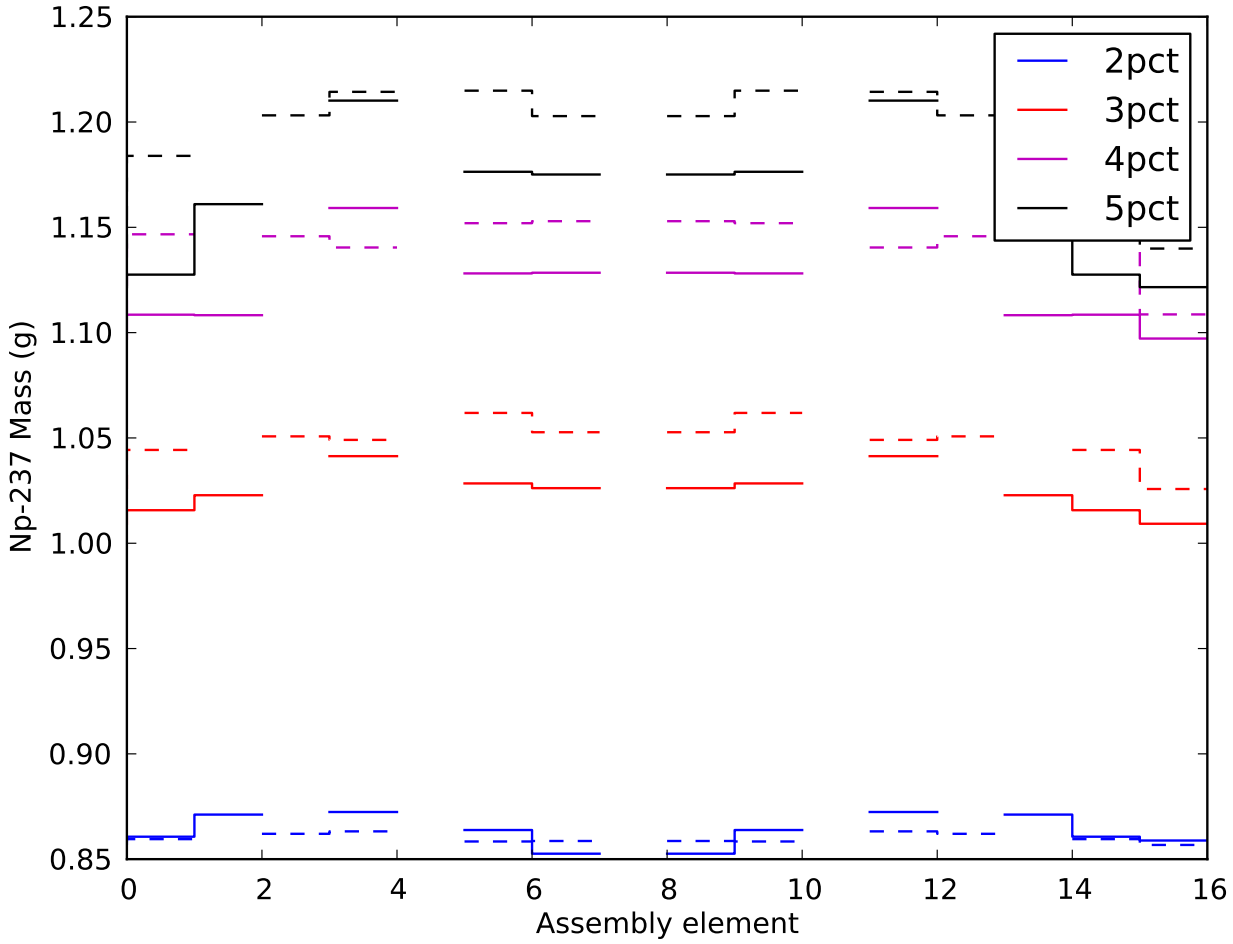
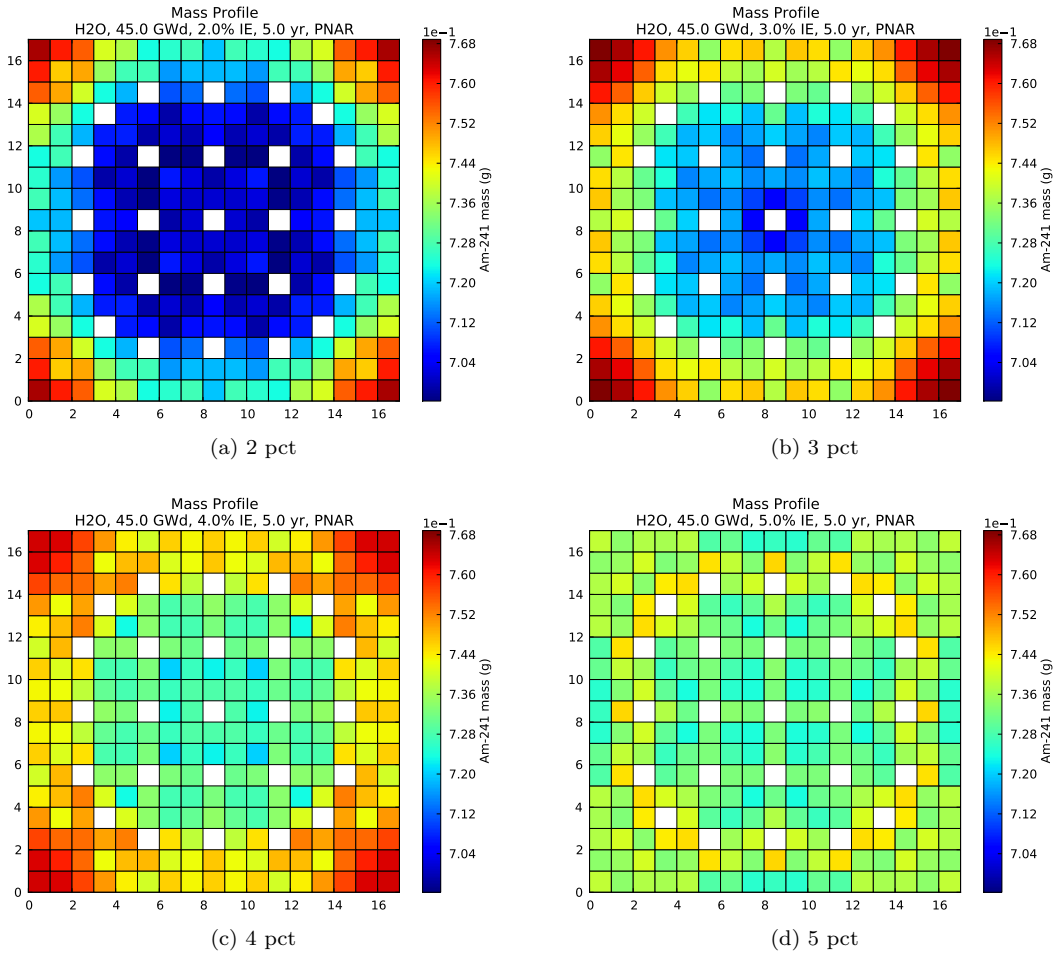


Figure 70: ^{237}Np mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

3.18 Am-241



(a) 2 pct

(b) 3 pct

(c) 4 pct

(d) 5 pct

Figure 71: Change in mass of ^{241}Am with an increase in Enrichment.

Figure 71 shows the change in the mass of ^{241}Am for a change in Enrichment; the range of Enrichment is 2–5 pct. The largest mass of ^{241}Am (195.6 g) occurs when Enrichment is 4 pct, and the smallest mass (189.9 g) occurs when Enrichment is 2 pct; the overall change in mass is 2.93 %. The change in the mass of ^{241}Am in the individual assemblies is given in Table 164.

Parameter	min (location)	max (location)	% diff
2	0.6963 (-2, 3, 0)	0.7661 (-8, -8, 0)	9.12
3	0.7047 (-1, 0, 0)	0.7689 (-8, -8, 0)	8.35
4	0.7201 (2, -2, 0)	0.7636 (-8, -8, 0)	5.68
5	0.7240 (1, 4, 0)	0.7459 (-7, 0, 0)	2.93

Table 164: The change in the mass of ^{241}Am for each assembly shown in Figure 71. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Am in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

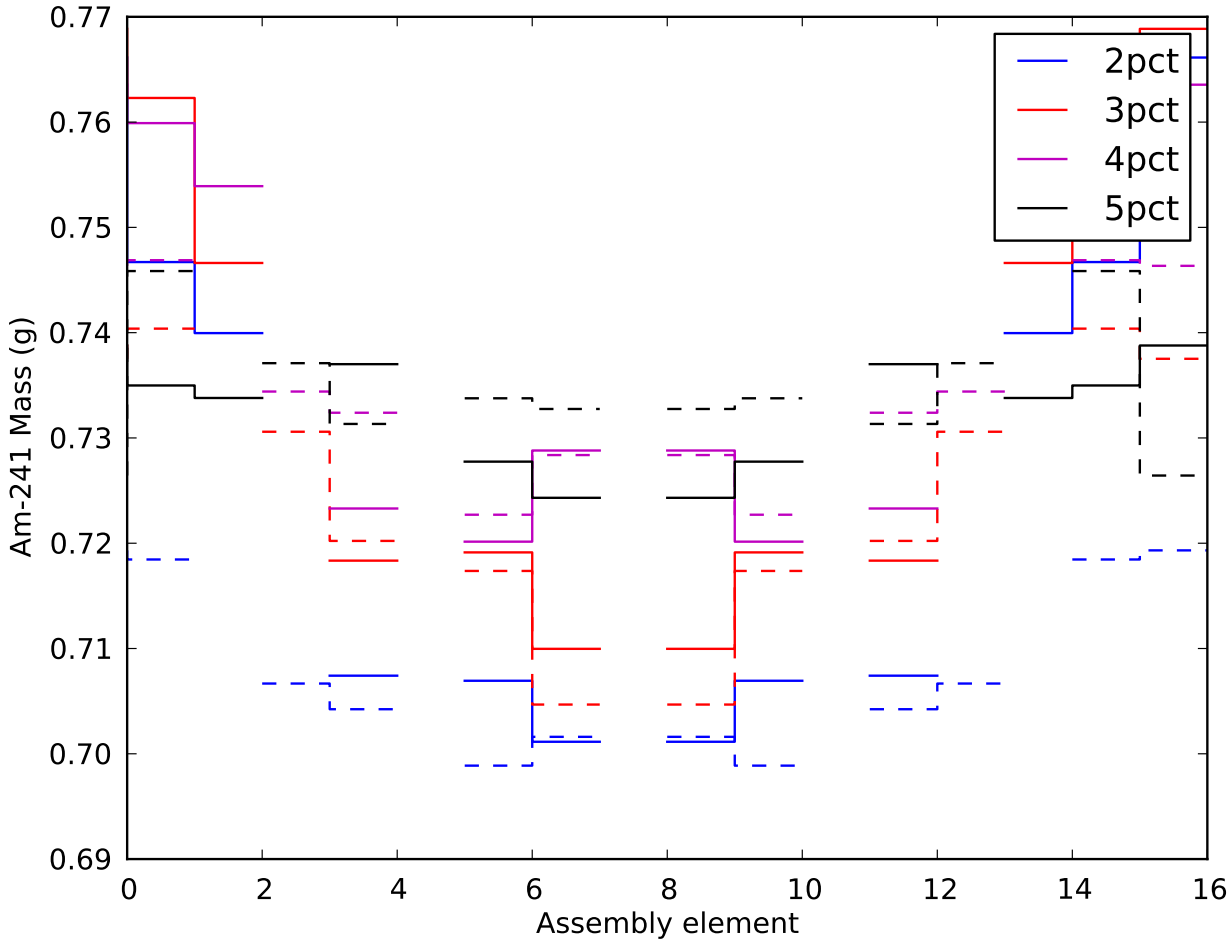
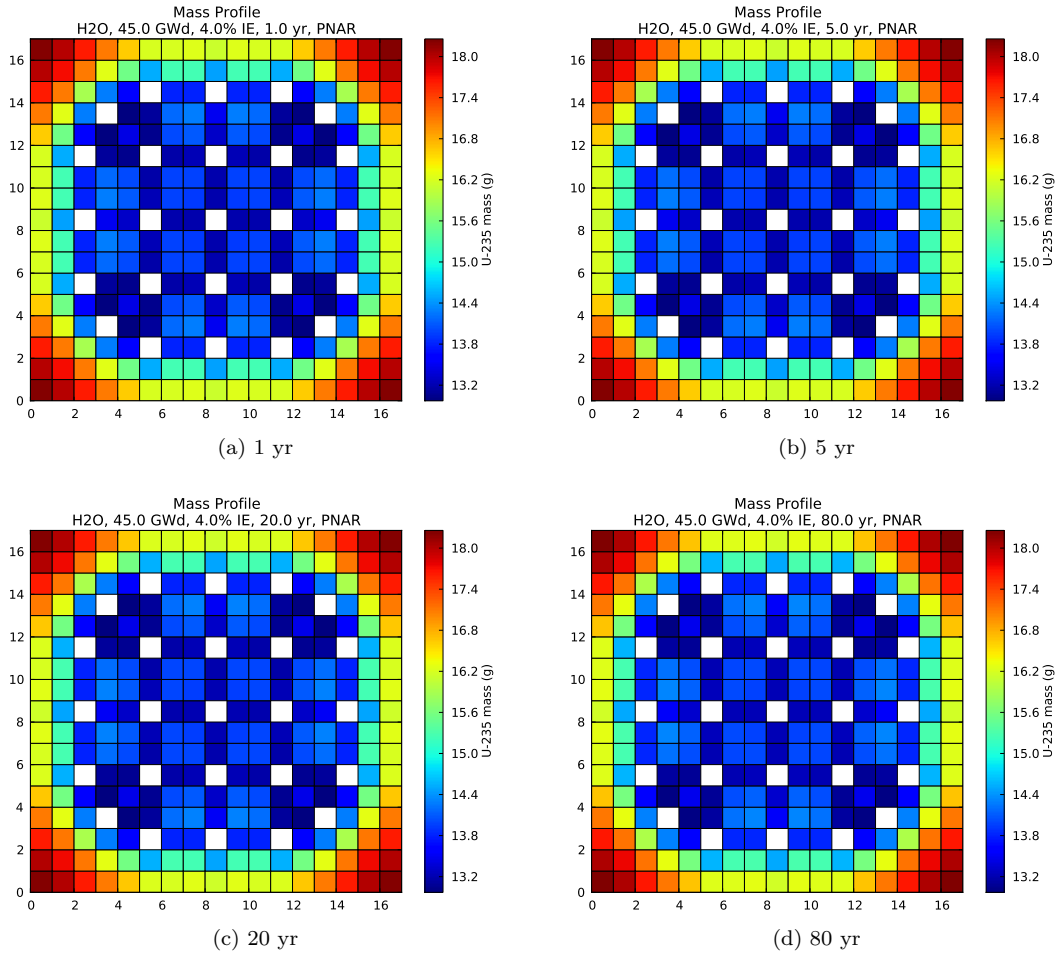


Figure 72: ^{241}Am mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4 Mass Changes with Cooling

4.1 U-235



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 73: Change in mass of ^{235}U with an increase in Cooling.

Figure 73 shows the change in the mass of ^{235}U for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{235}U (3945 g) occurs when Cooling is 80 yr, and the smallest mass (3936 g) occurs when Cooling is 1 yr; the overall change in mass is 0.23 %. The change in the mass of ^{235}U in the individual assemblies is given in Table 165.

Parameter	min (location)	max (location)	% diff
1	12.9714 (4, -5, 0)	18.2228 (-8, -8, 0)	28.82
5	12.9773 (4, -5, 0)	18.2247 (-8, -8, 0)	28.79
20	12.9813 (4, -5, 0)	18.2338 (-8, -8, 0)	28.81
80	13.0089 (4, -5, 0)	18.2585 (-8, -8, 0)	28.75

Table 165: The change in the mass of ^{235}U for each assembly shown in Figure 73. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{235}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

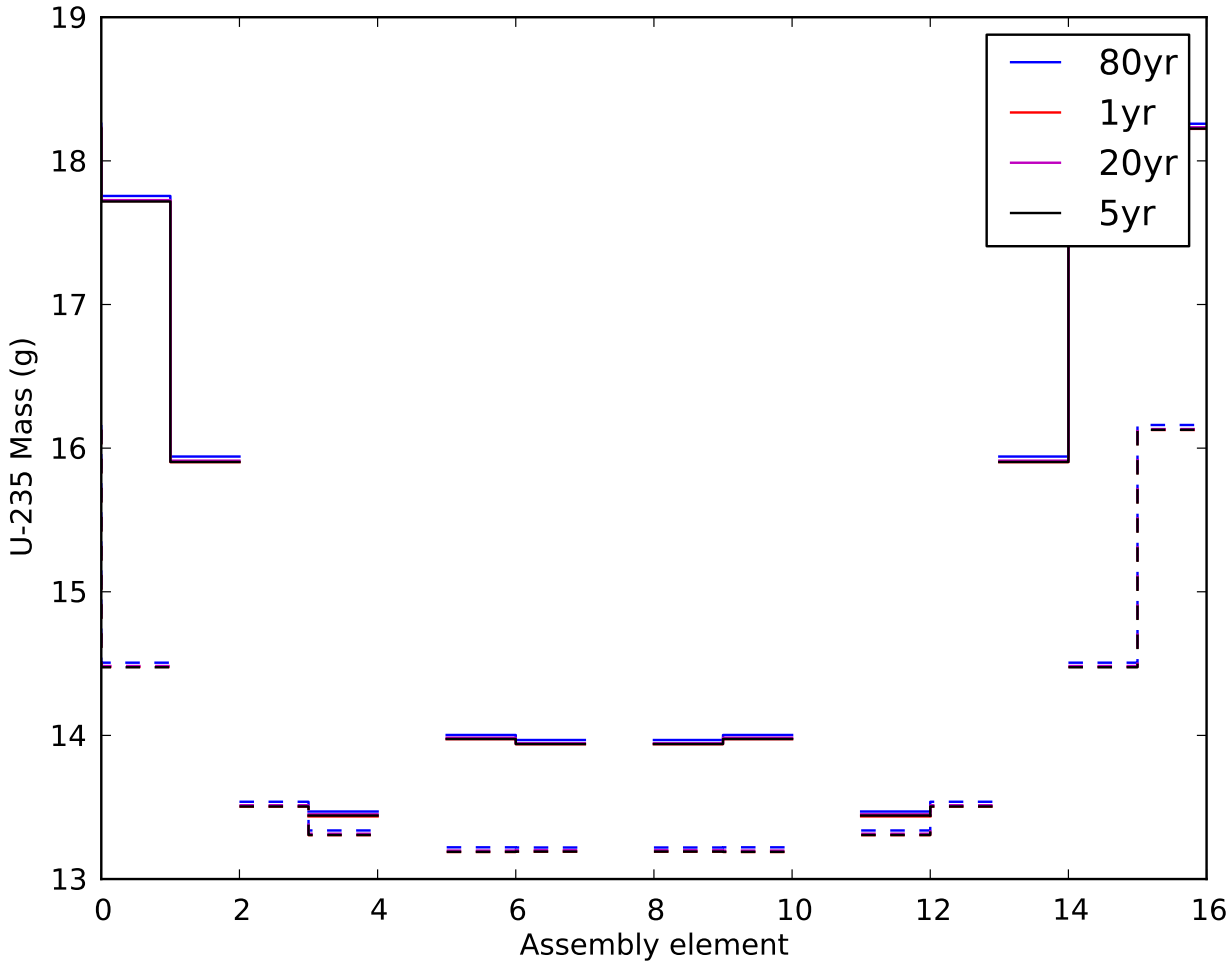
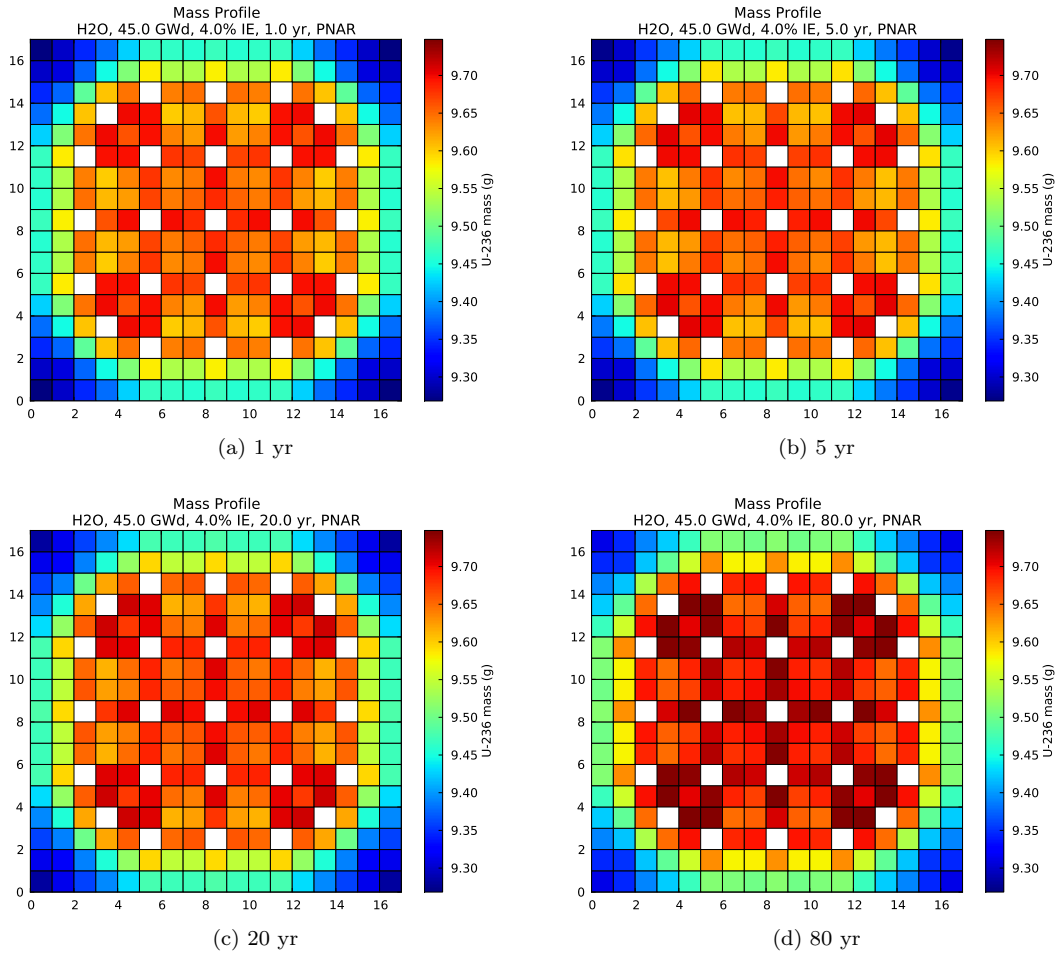


Figure 74: ^{235}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.2 U-236



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 75: Change in mass of ^{236}U with an increase in Cooling.

Figure 75 shows the change in the mass of ^{236}U for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{236}U (2535 g) occurs when Cooling is 80 yr, and the smallest mass (2523 g) occurs when Cooling is 1 yr; the overall change in mass is 0.48 %. The change in the mass of ^{236}U in the individual assemblies is given in Table 166.

Parameter	min (location)	max (location)	% diff
1	9.2682 (-8, -8, 0)	9.7003 (4, -5, 0)	4.45
5	9.2739 (-8, -8, 0)	9.7063 (4, -5, 0)	4.45
20	9.2817 (-8, -8, 0)	9.7146 (4, -5, 0)	4.46
80	9.3119 (-8, -8, 0)	9.7479 (4, -5, 0)	4.47

Table 166: The change in the mass of ^{236}U for each assembly shown in Figure 75. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{236}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

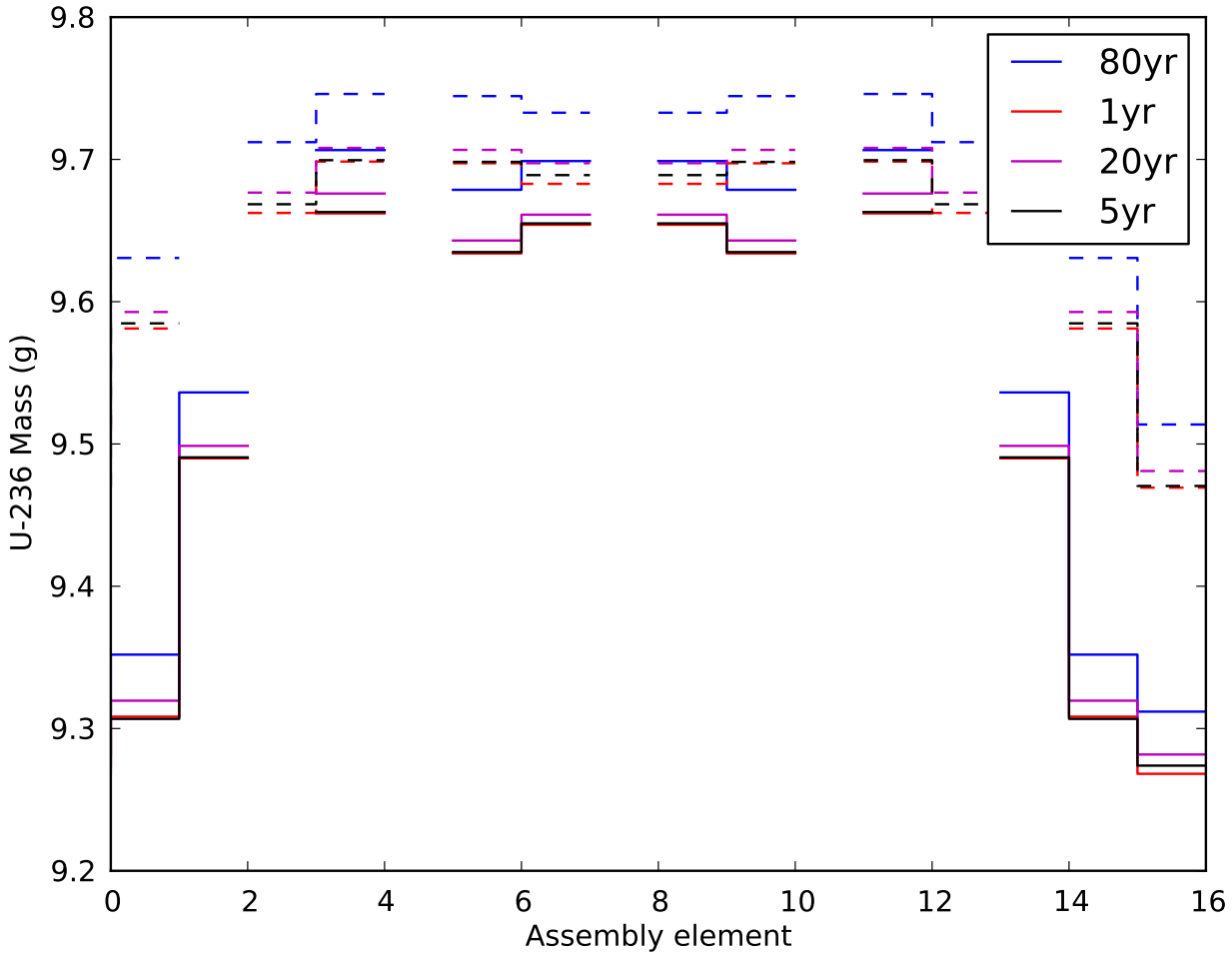
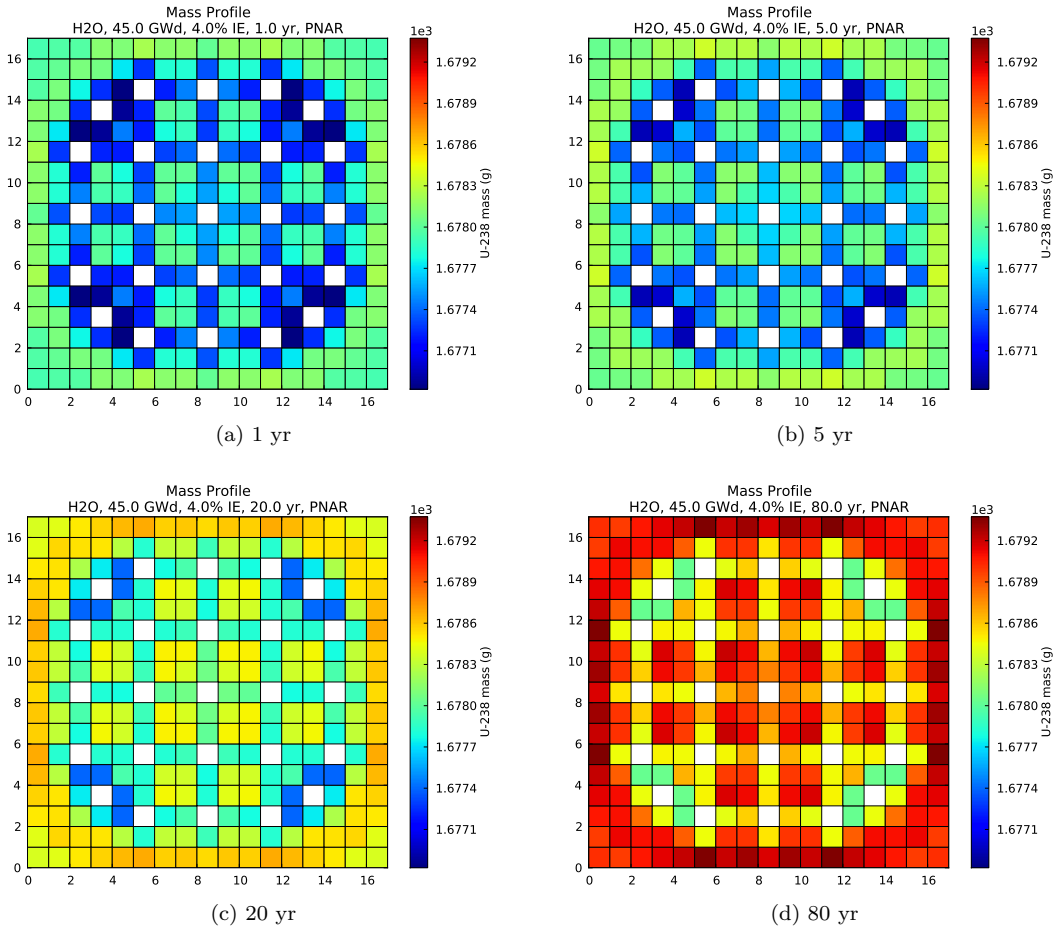


Figure 76: ^{236}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.3 U-238



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 77: Change in mass of ^{238}U with an increase in Cooling.

Figure 77 shows the change in the mass of ^{238}U for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{238}U (4.432×10^5 g) occurs when Cooling is 80 yr, and the smallest mass (4.429×10^5 g) occurs when Cooling is 1 yr; the overall change in mass is 0.07 %. The change in the mass of ^{238}U in the individual assemblies is given in Table 167.

Parameter	min (location)	max (location)	% diff
1	1676.8211 (-4, 6, 0)	1678.2367 (8, 3, 0)	0.08
5	1676.9486 (-4, 6, 0)	1678.3526 (8, 3, 0)	0.08
20	1677.3967 (-4, 6, 0)	1678.6813 (8, 3, 0)	0.08
80	1678.0353 (-4, 6, 0)	1679.3737 (8, 3, 0)	0.08

Table 167: The change in the mass of ^{238}U for each assembly shown in Figure 77. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{238}U in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

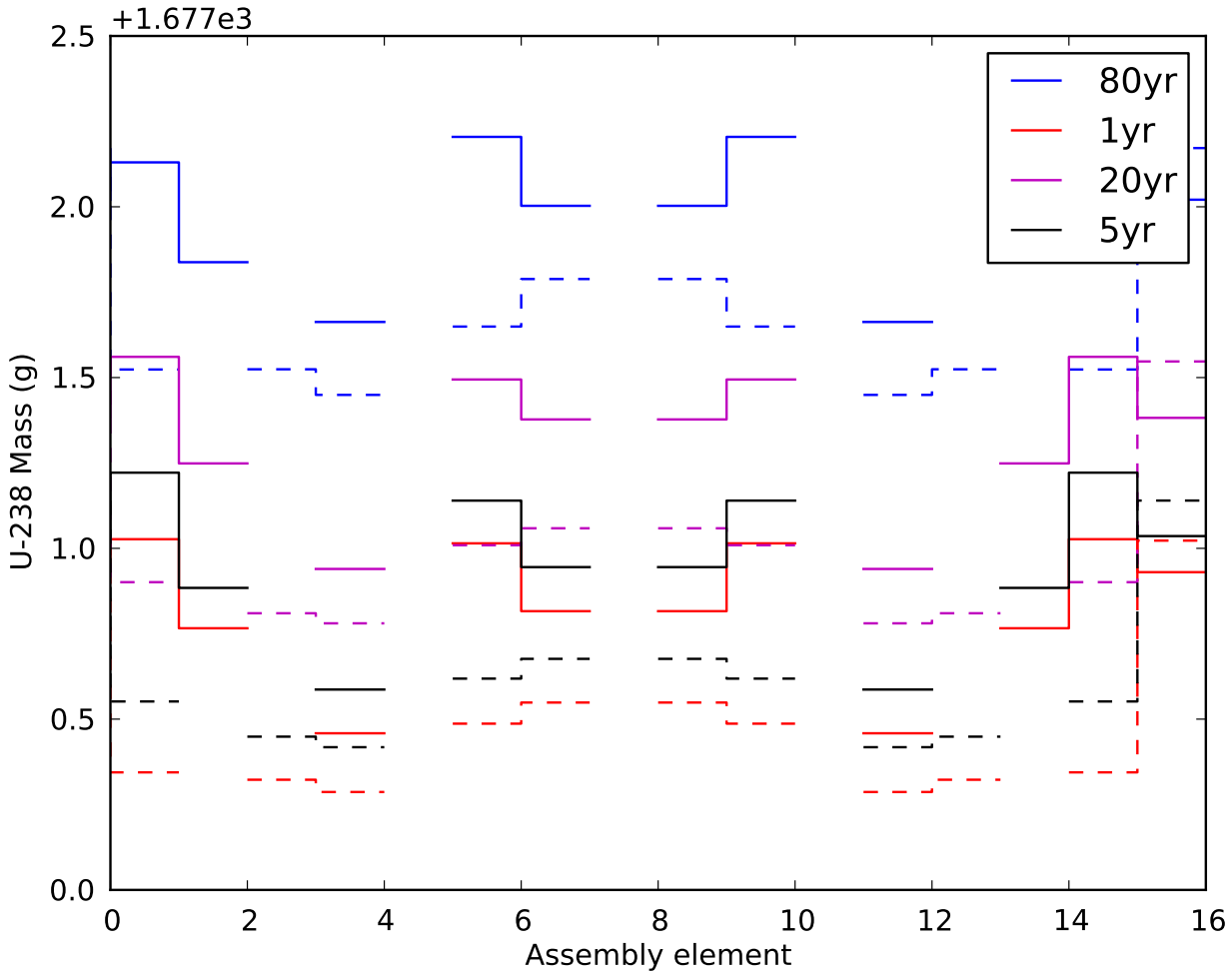
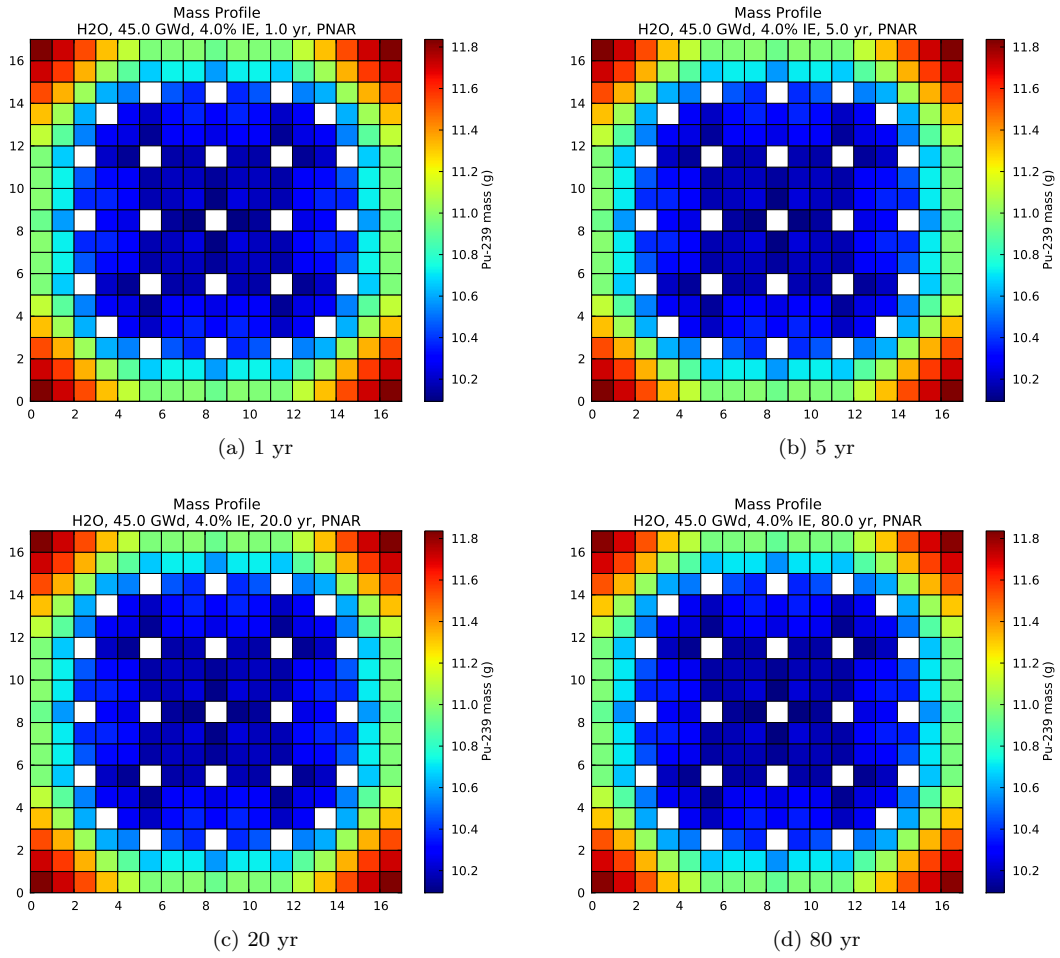


Figure 78: ^{238}U mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.4 Pu-239



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 79: Change in mass of ^{239}Pu with an increase in Cooling.

Figure 79 shows the change in the mass of ^{239}Pu for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{239}Pu (2817 g) occurs when Cooling is 1 yr, and the smallest mass (2814 g) occurs when Cooling is 80 yr; the overall change in mass is 0.12 %. The change in the mass of ^{239}Pu in the individual assemblies is given in Table 168.

Parameter	min (location)	max (location)	% diff
1	10.1064 (-1, 0, 0)	11.8366 (-8, -8, 0)	14.62
5	10.1068 (-1, 0, 0)	11.8325 (-8, -8, 0)	14.58
20	10.1089 (-1, 0, 0)	11.8340 (-8, -8, 0)	14.58
80	10.0932 (-1, 0, 0)	11.8175 (-8, -8, 0)	14.59

Table 168: The change in the mass of ^{239}Pu for each assembly shown in Figure 79. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{239}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

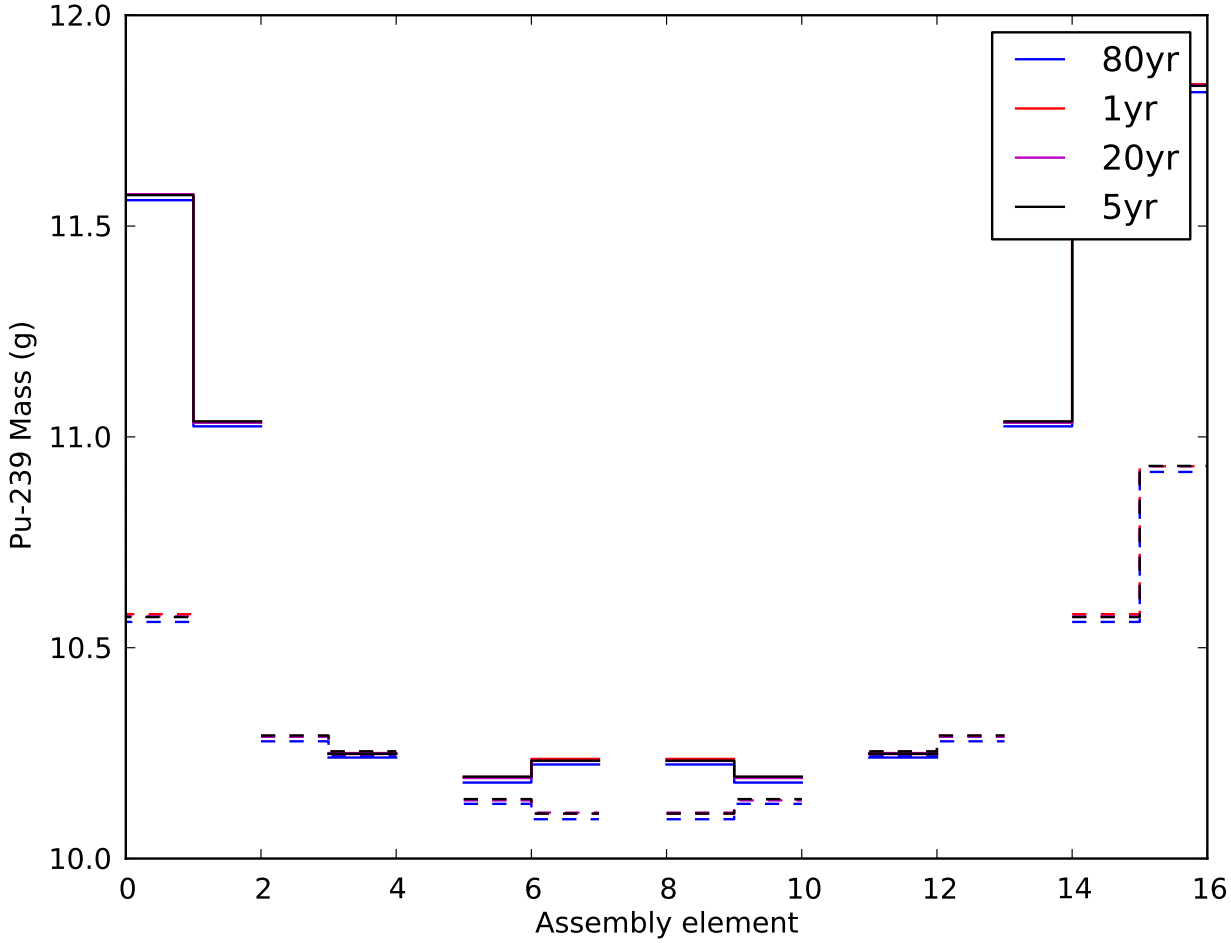
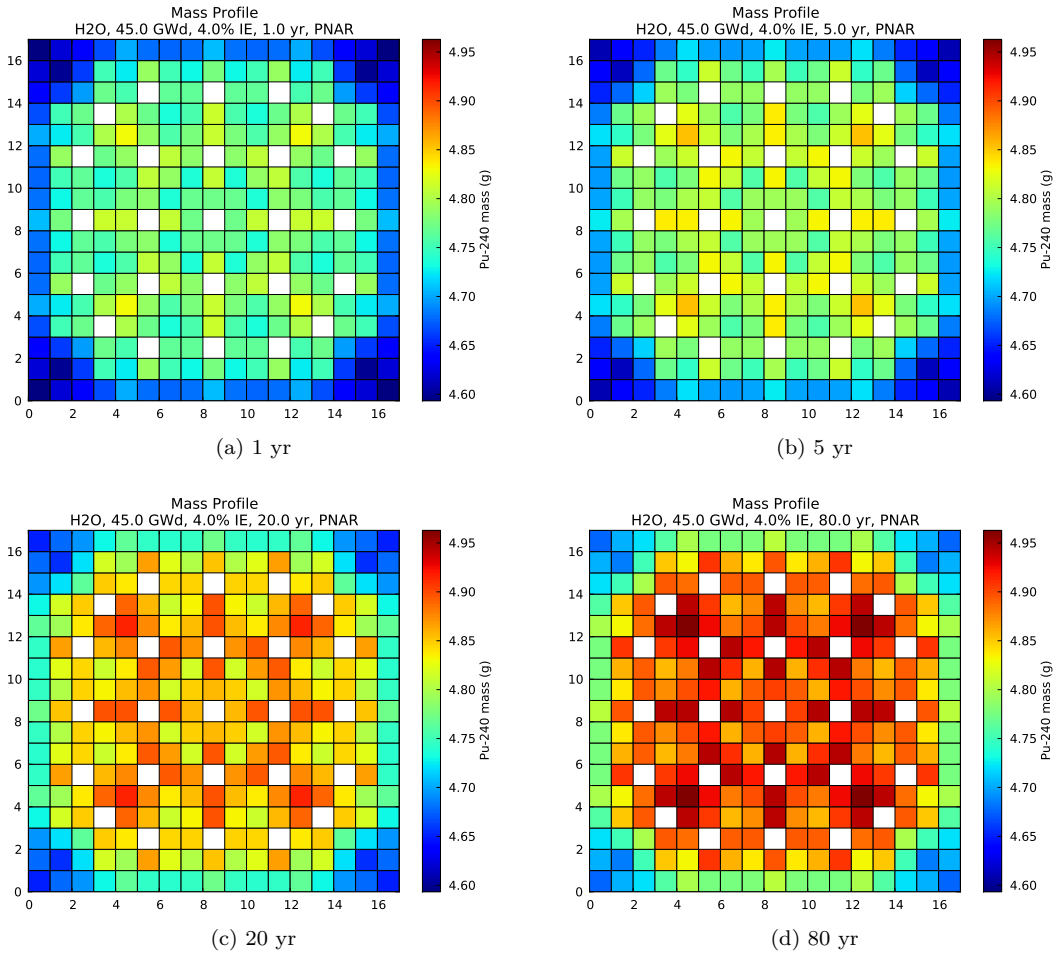


Figure 80: ^{239}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.5 Pu-240



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 81: Change in mass of ^{240}Pu with an increase in Cooling.

Figure 81 shows the change in the mass of ^{240}Pu for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{240}Pu (1281 g) occurs when Cooling is 80 yr, and the smallest mass (1251 g) occurs when Cooling is 1 yr; the overall change in mass is 2.37 %. The change in the mass of ^{240}Pu in the individual assemblies is given in Table 169.

Parameter	min (location)	max (location)	% diff
1	4.5933 (-8, -8, 0)	4.8308 (-4, -4, 0)	4.92
5	4.6099 (-8, -8, 0)	4.8541 (-4, -4, 0)	5.03
20	4.6505 (-8, -8, 0)	4.9154 (-4, -4, 0)	5.39
80	4.6766 (-8, -8, 0)	4.9629 (-4, -4, 0)	5.77

Table 169: The change in the mass of ^{240}Pu for each assembly shown in Figure 81. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{240}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

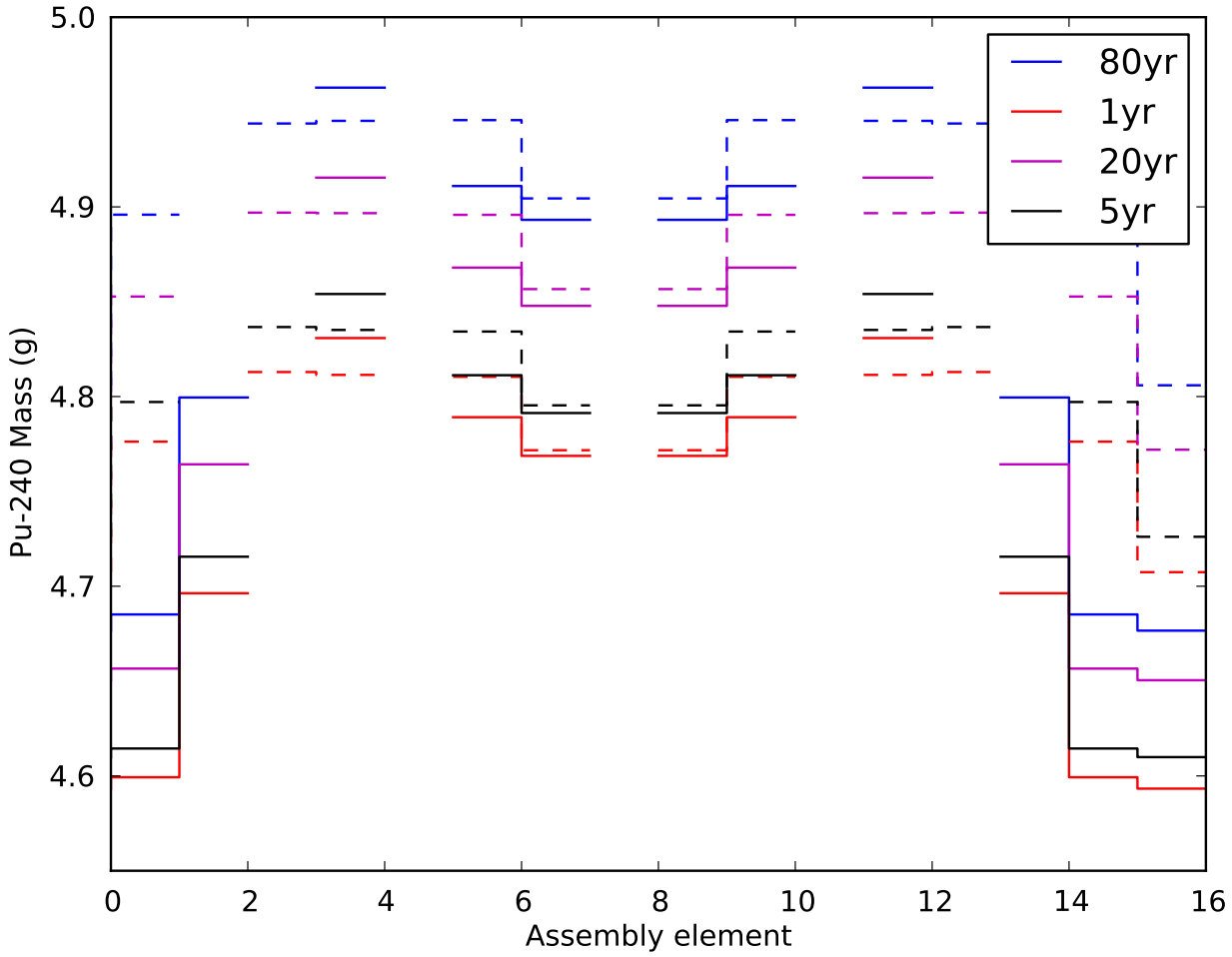
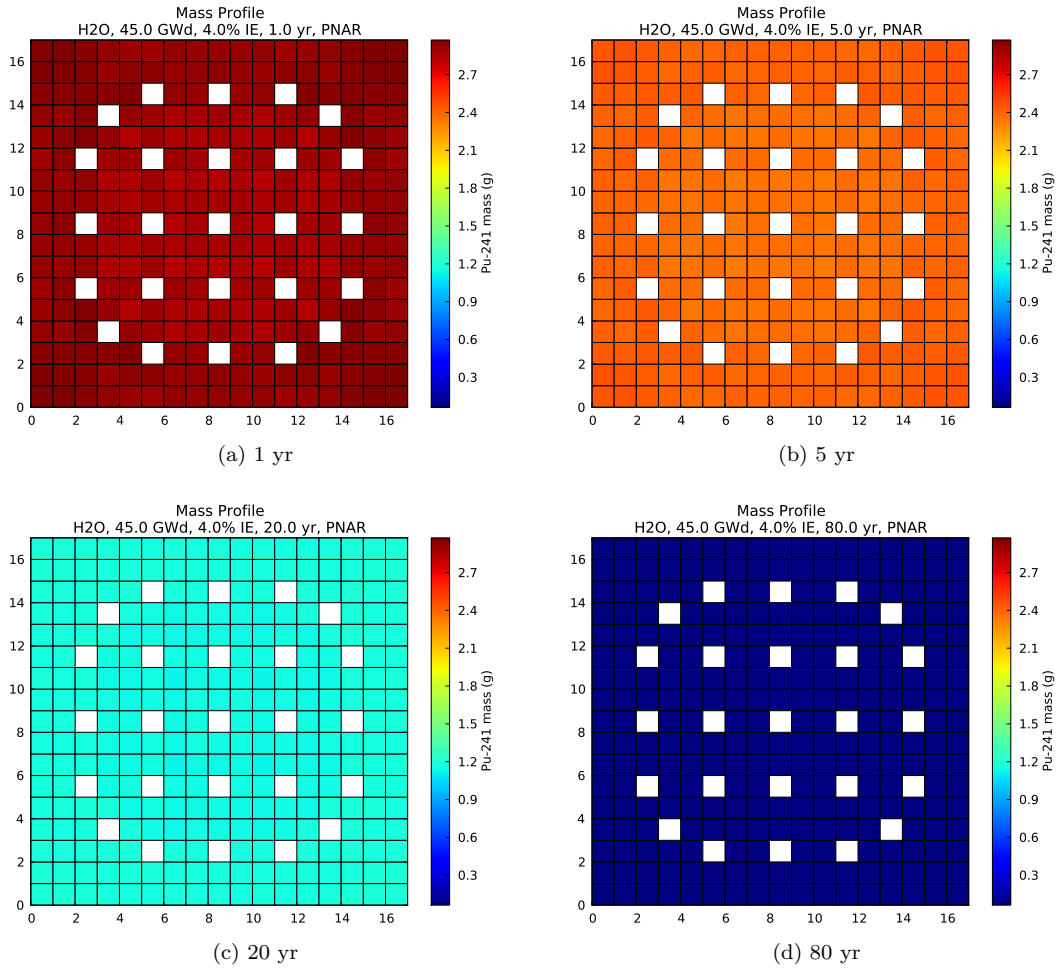


Figure 82: ^{240}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.6 Pu-241



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 83: Change in mass of ^{241}Pu with an increase in Cooling.

Figure 83 shows the change in the mass of ^{241}Pu for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{241}Pu (767.1 g) occurs when Cooling is 1 yr, and the smallest mass (16.91 g) occurs when Cooling is 80 yr; the overall change in mass is 97.80 %. The change in the mass of ^{241}Pu in the individual assemblies is given in Table 170.

Parameter	min (location)	max (location)	% diff
1	2.8295 (2, -2, 0)	2.9752 (-7, -8, 0)	4.89
5	2.3325 (2, -2, 0)	2.4523 (-7, -8, 0)	4.88
20	1.1303 (2, -2, 0)	1.1888 (-7, -8, 0)	4.91
80	0.0624 (2, -2, 0)	0.0656 (-7, -8, 0)	4.89

Table 170: The change in the mass of ^{241}Pu for each assembly shown in Figure 83. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

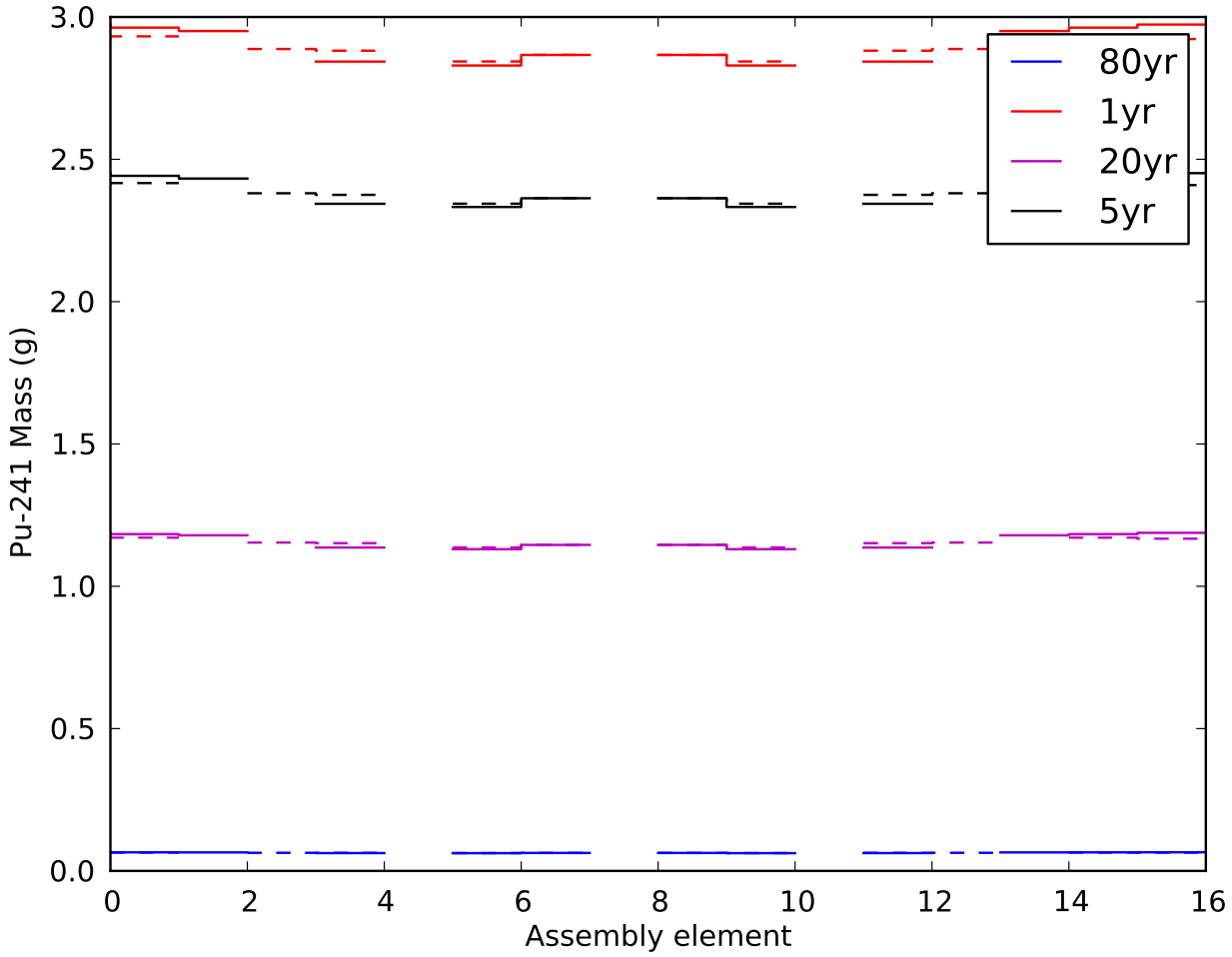
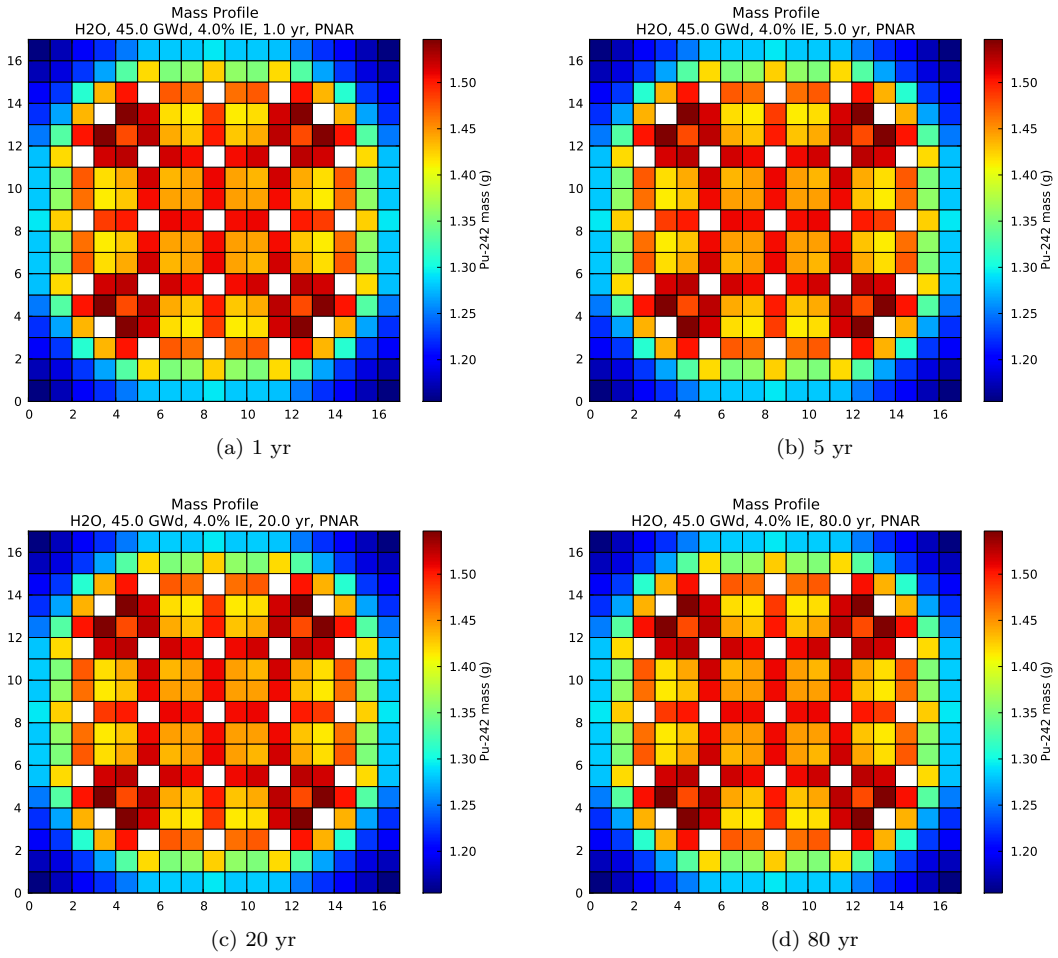


Figure 84: ^{241}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.7 Pu-242



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 85: Change in mass of ^{242}Pu with an increase in Cooling.

Figure 85 shows the change in the mass of ^{242}Pu for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{242}Pu (365.4 g) occurs when Cooling is 80 yr, and the smallest mass (365.1 g) occurs when Cooling is 1 yr; the overall change in mass is 0.06 %. The change in the mass of ^{242}Pu in the individual assemblies is given in Table 171.

Parameter	min (location)	max (location)	% diff
1	1.1548 (-8, -8, 0)	1.5451 (4, -5, 0)	25.26
5	1.1549 (-8, -8, 0)	1.5452 (4, -5, 0)	25.26
20	1.1552 (-8, -8, 0)	1.5456 (4, -5, 0)	25.26
80	1.1554 (-8, -8, 0)	1.5467 (4, -5, 0)	25.30

Table 171: The change in the mass of ^{242}Pu for each assembly shown in Figure 85. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{242}Pu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

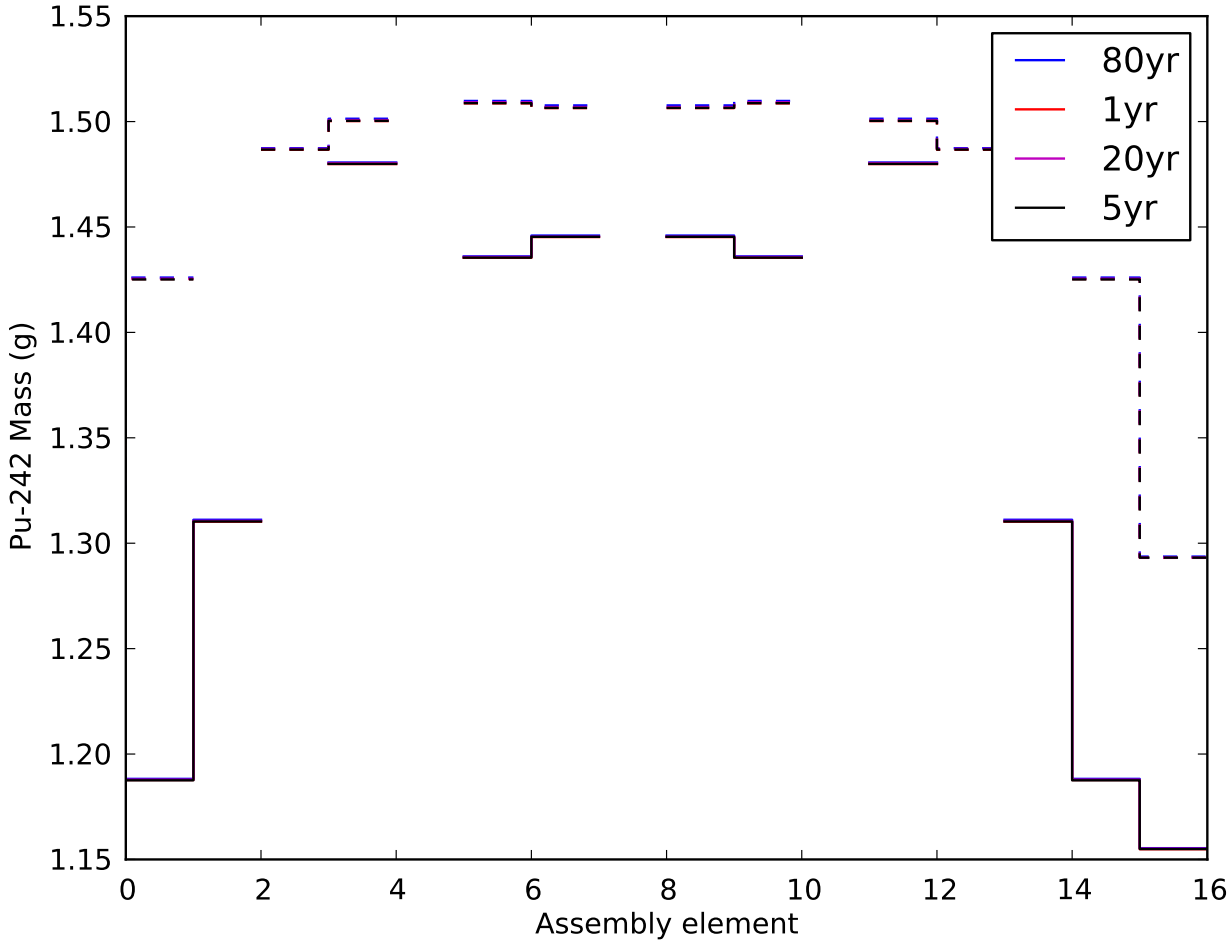
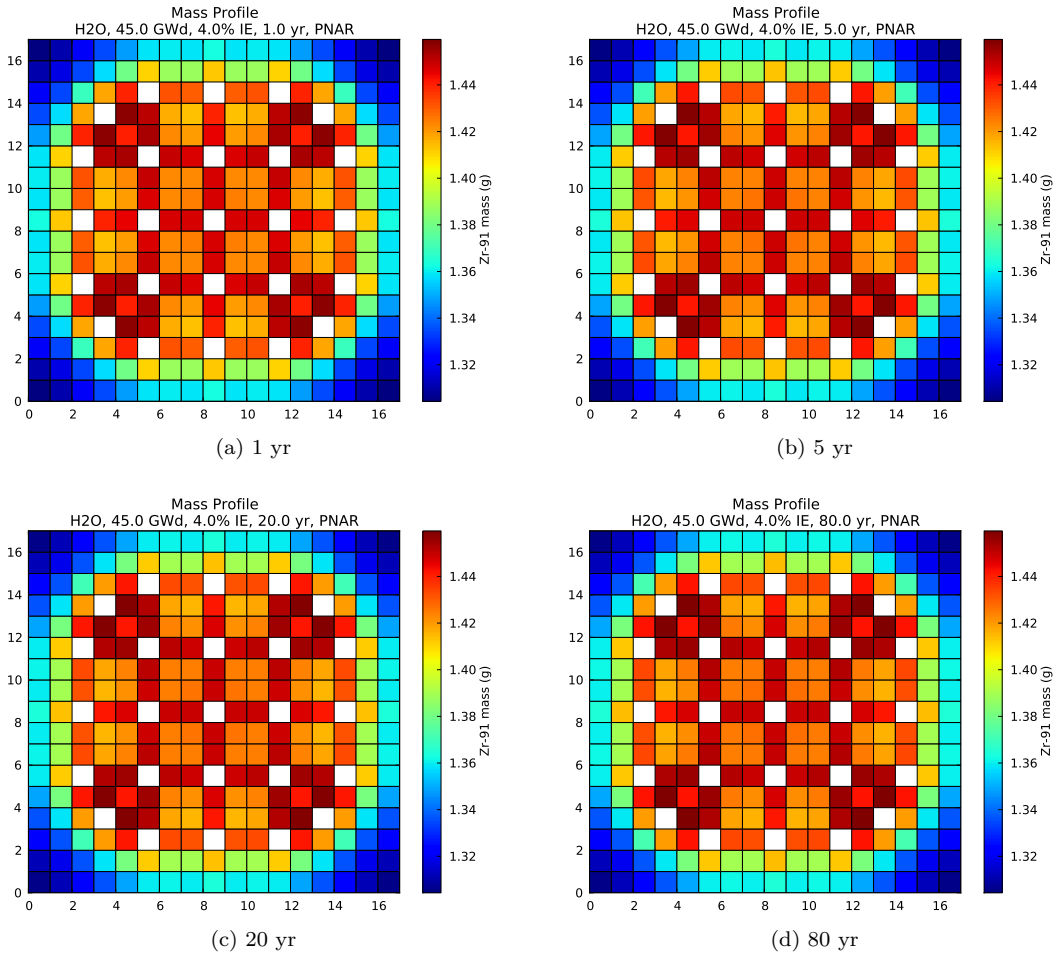


Figure 86: ^{242}Pu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.8 Zr-91



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 87: Change in mass of ^{91}Zr with an increase in Cooling.

Figure 87 shows the change in the mass of ^{91}Zr for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{91}Zr (369.7 g) occurs when Cooling is 80 yr, and the smallest mass (369.1 g) occurs when Cooling is 1 yr; the overall change in mass is 0.15 %. The change in the mass of ^{91}Zr in the individual assemblies is given in Table 172.

Parameter	min (location)	max (location)	% diff
1	1.3043 (-8, -8, 0)	1.4572 (4, -5, 0)	10.49
5	1.3055 (-8, -8, 0)	1.4584 (4, -5, 0)	10.48
20	1.3057 (-8, -8, 0)	1.4587 (4, -5, 0)	10.49
80	1.3061 (-8, -8, 0)	1.4595 (4, -5, 0)	10.51

Table 172: The change in the mass of ^{91}Zr for each assembly shown in Figure 87. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{91}Zr in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

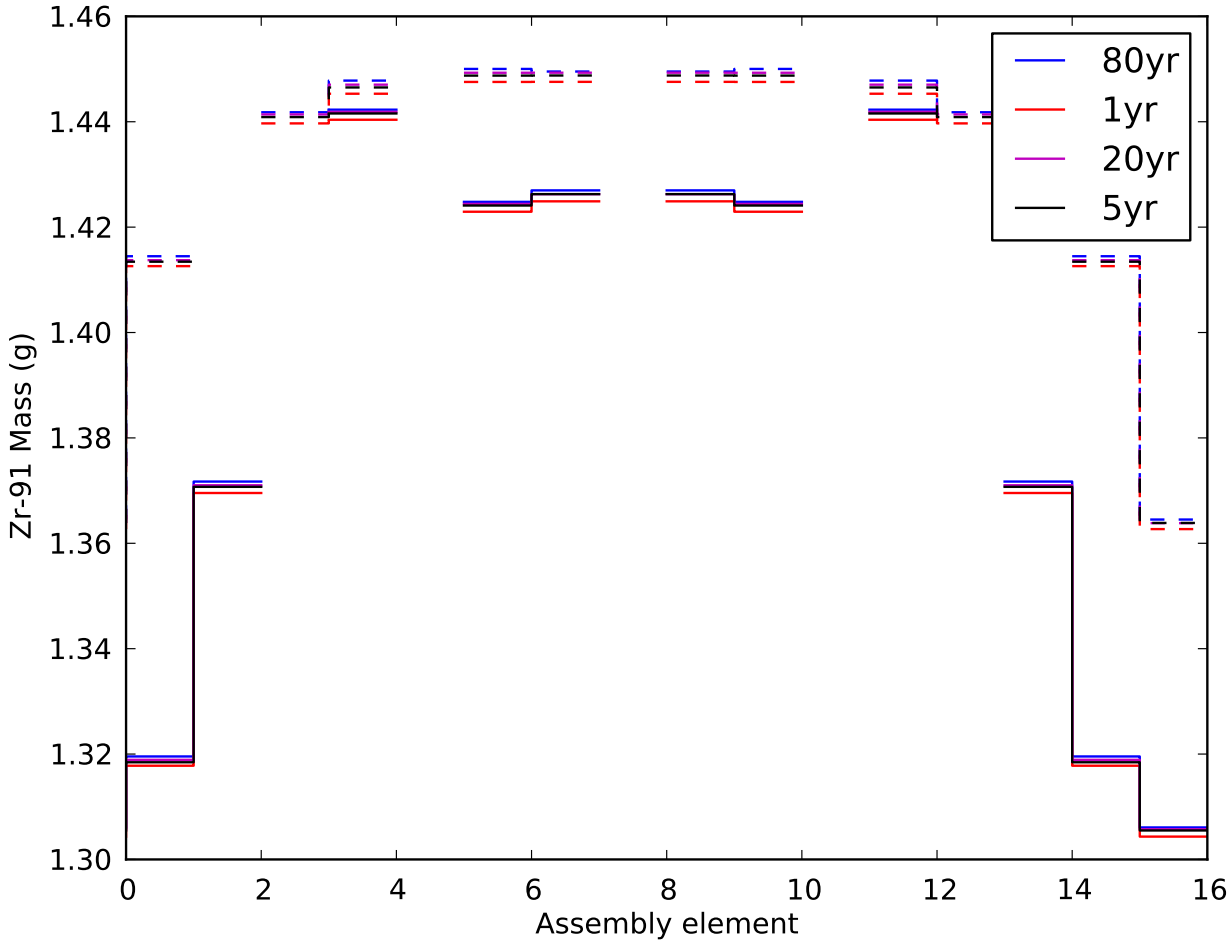
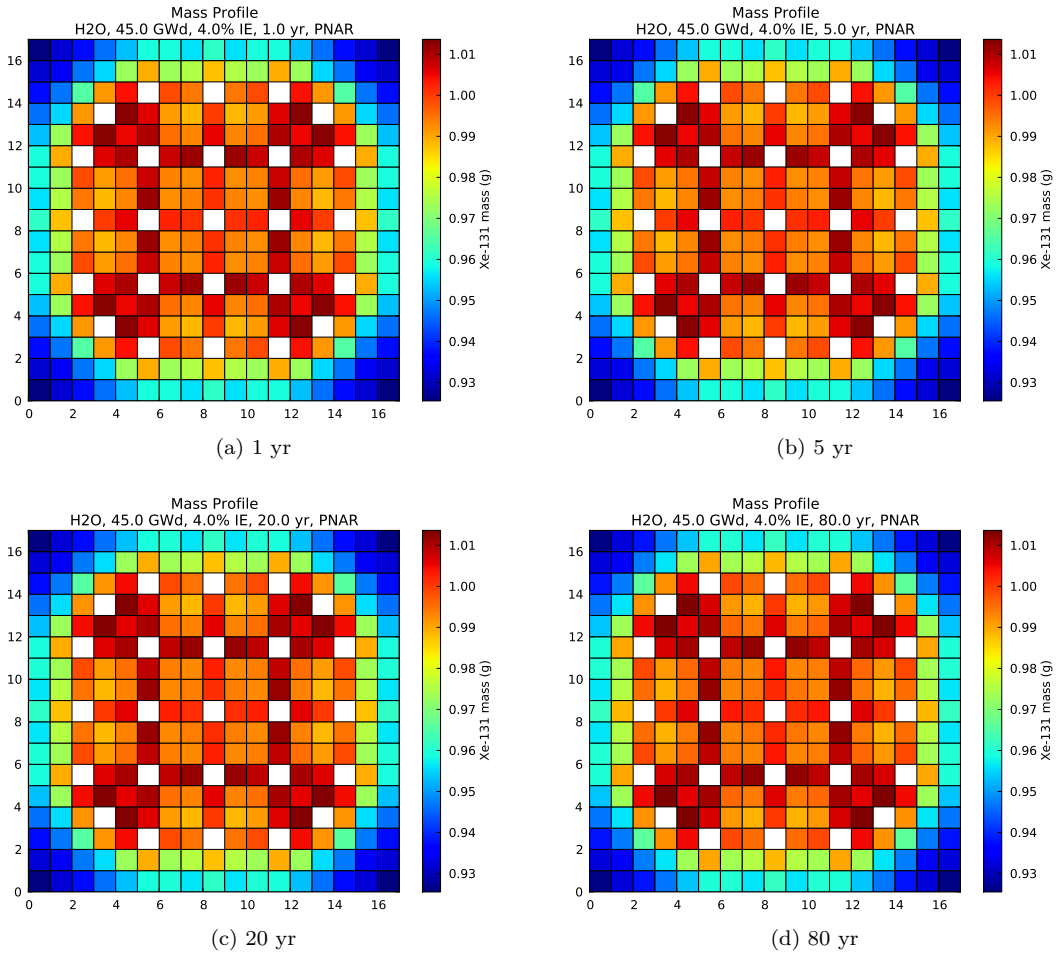


Figure 88: ^{91}Zr mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.9 Xe-131



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 89: Change in mass of ^{131}Xe with an increase in Cooling.

Figure 89 shows the change in the mass of ^{131}Xe for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{131}Xe (258.9 g) occurs when Cooling is 80 yr, and the smallest mass (258.7 g) occurs when Cooling is 1 yr; the overall change in mass is 0.07 %. The change in the mass of ^{131}Xe in the individual assemblies is given in Table 173.

Parameter	min (location)	max (location)	% diff
1	0.9255 (-8, -8, 0)	1.0126 (4, -5, 0)	8.60
5	0.9256 (-8, -8, 0)	1.0127 (4, -5, 0)	8.60
20	0.9258 (-8, -8, 0)	1.0130 (4, -5, 0)	8.61
80	0.9261 (-8, -8, 0)	1.0136 (4, -5, 0)	8.63

Table 173: The change in the mass of ^{131}Xe for each assembly shown in Figure 89. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{131}Xe in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

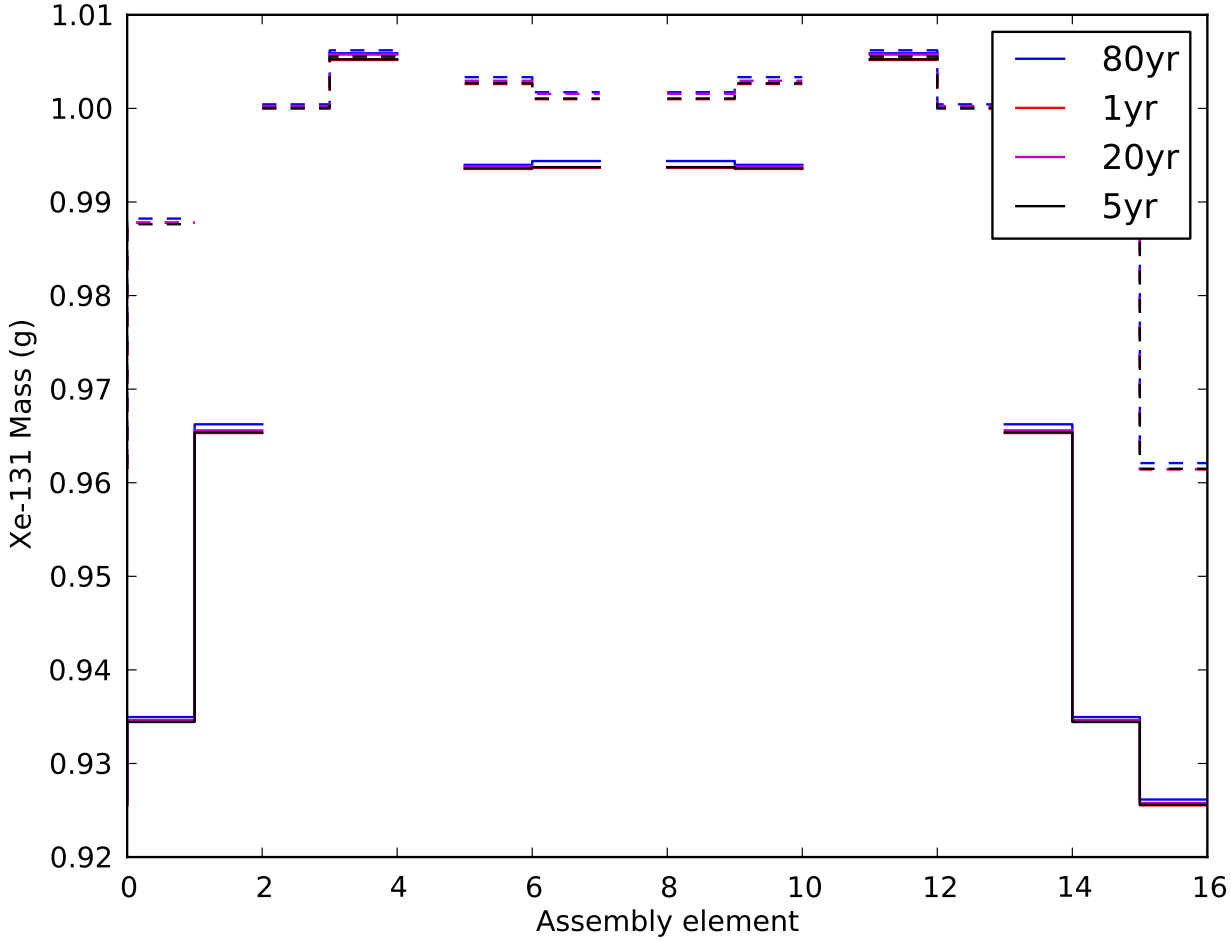
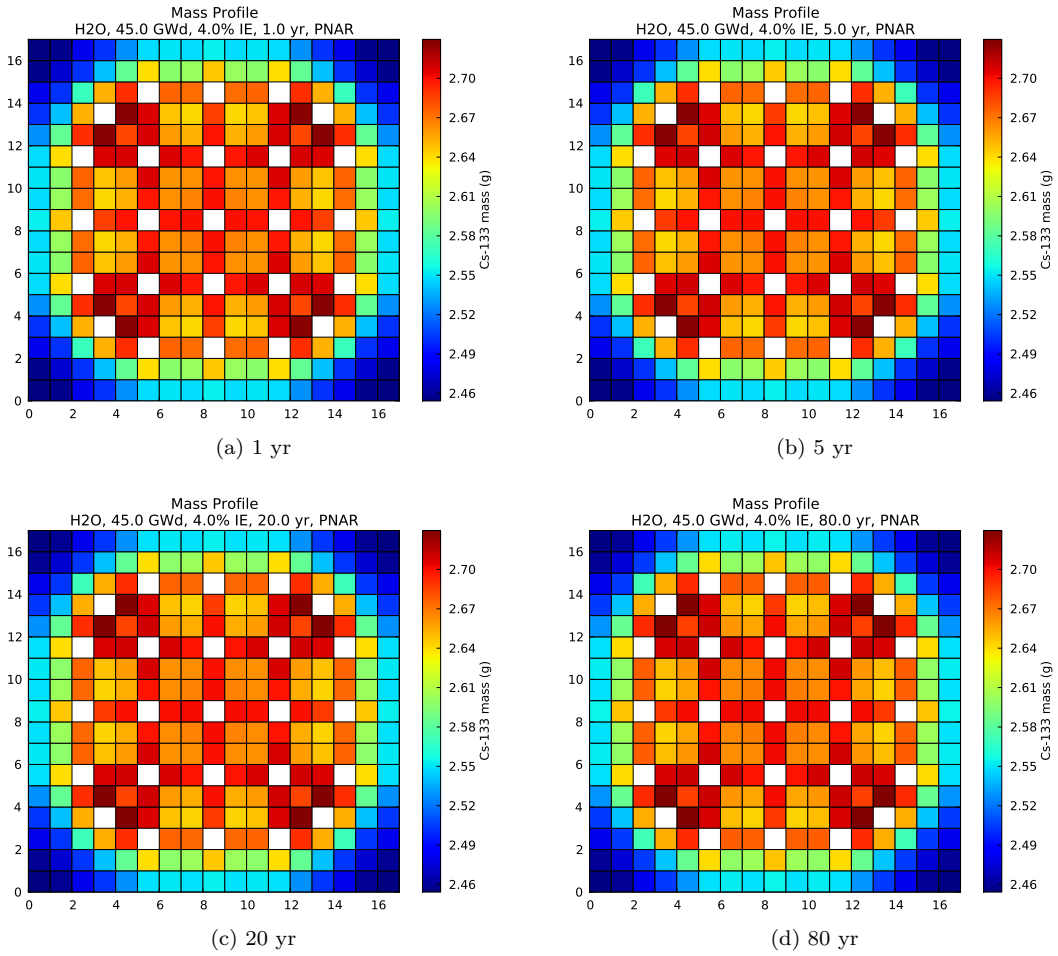


Figure 90: ^{131}Xe mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.10 Cs-133



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 91: Change in mass of ^{133}Cs with an increase in Cooling.

Figure 91 shows the change in the mass of ^{133}Cs for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{133}Cs (691.1 g) occurs when Cooling is 80 yr, and the smallest mass (690.7 g) occurs when Cooling is 1 yr; the overall change in mass is 0.07 %. The change in the mass of ^{133}Cs in the individual assemblies is given in Table 174.

Parameter	min (location)	max (location)	% diff
1	2.4542 (-8, -8, 0)	2.7273 (4, -5, 0)	10.01
5	2.4544 (-8, -8, 0)	2.7275 (4, -5, 0)	10.01
20	2.4549 (-8, -8, 0)	2.7283 (4, -5, 0)	10.02
80	2.4554 (-8, -8, 0)	2.7297 (4, -5, 0)	10.05

Table 174: The change in the mass of ^{133}Cs for each assembly shown in Figure 91. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{133}Cs in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

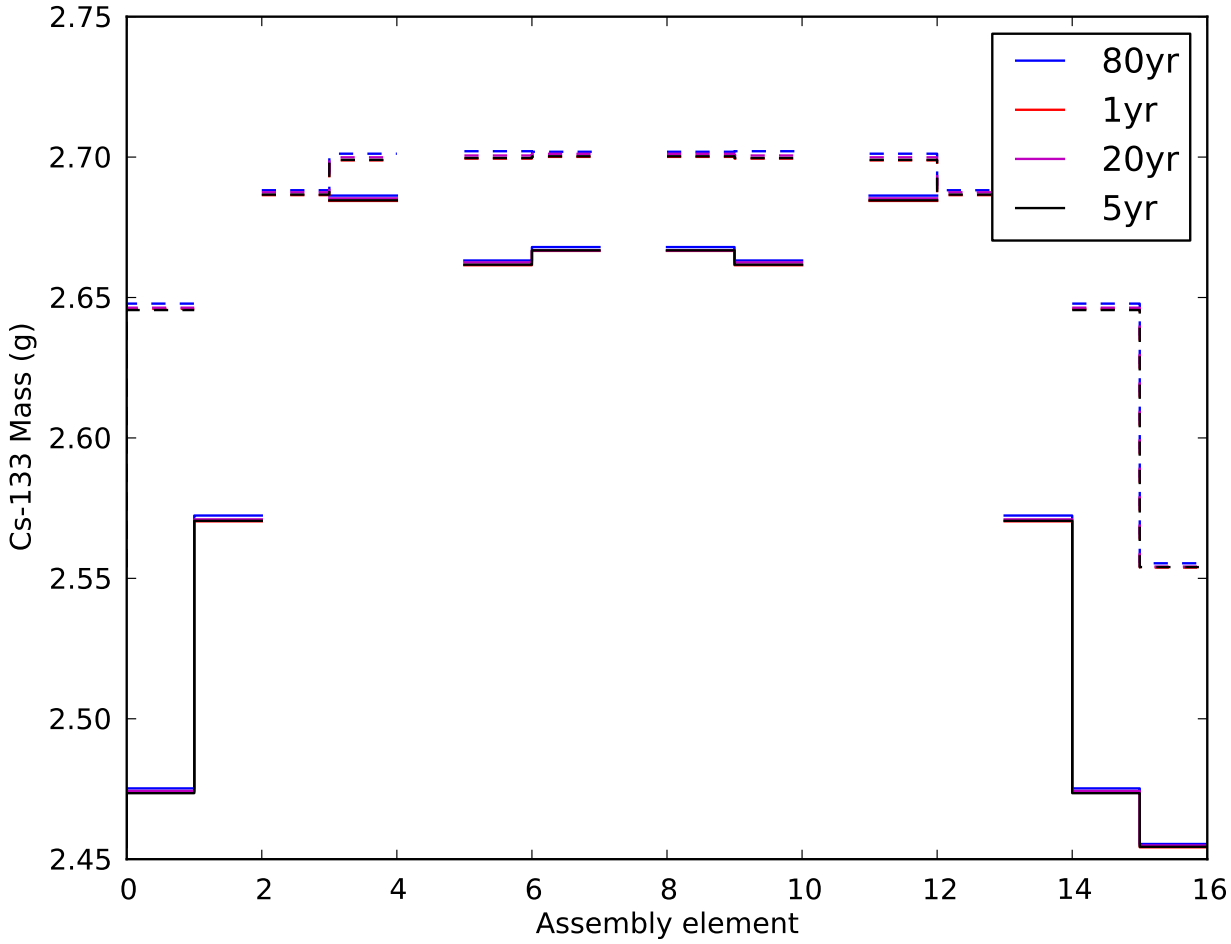
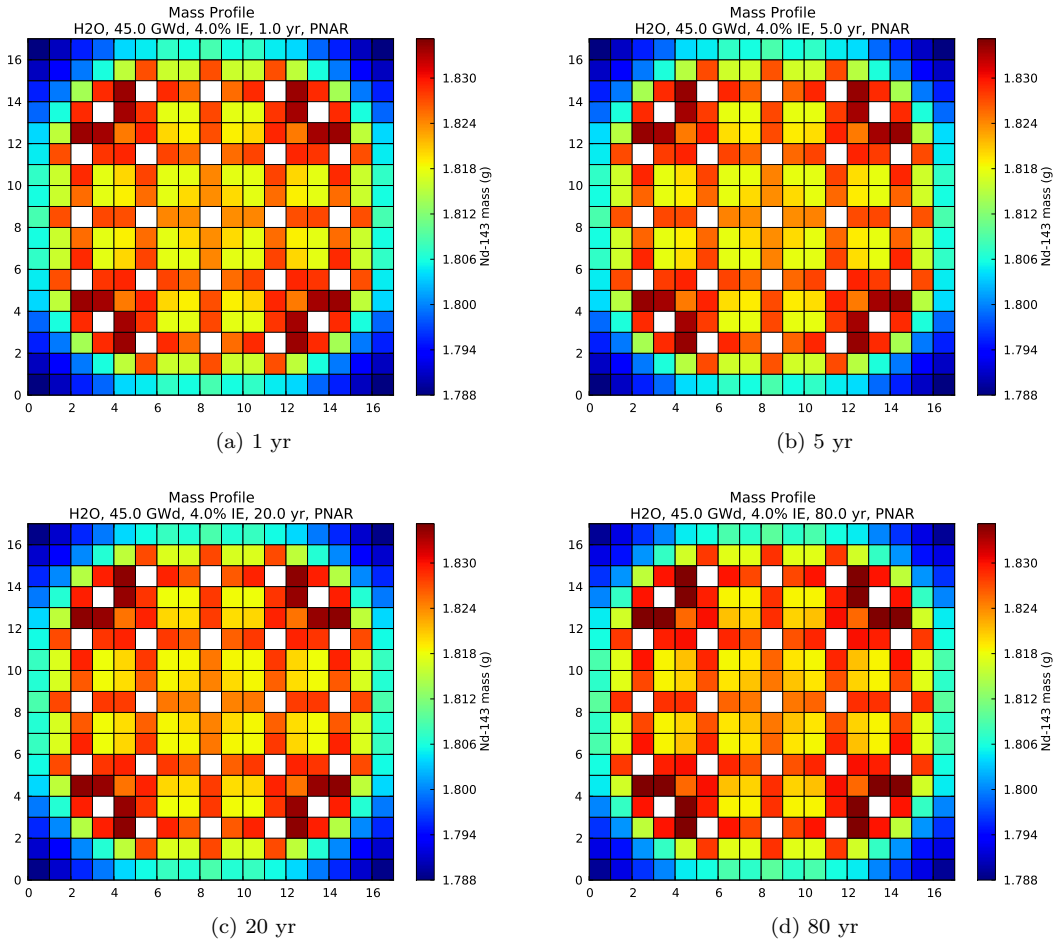


Figure 92: ^{133}Cs mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.11 Nd-143



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 93: Change in mass of ^{143}Nd with an increase in Cooling.

Figure 93 shows the change in the mass of ^{143}Nd for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{143}Nd (479.8 g) occurs when Cooling is 80 yr, and the smallest mass (479.5 g) occurs when Cooling is 1 yr; the overall change in mass is 0.07 %. The change in the mass of ^{143}Nd in the individual assemblies is given in Table 175.

Parameter	min (location)	max (location)	% diff
1	1.7880 (-8, -8, 0)	1.8341 (-4, 6, 0)	2.51
5	1.7881 (-8, -8, 0)	1.8342 (-4, 6, 0)	2.51
20	1.7885 (-8, -8, 0)	1.8345 (-4, 6, 0)	2.51
80	1.7890 (-8, -8, 0)	1.8352 (-4, 6, 0)	2.52

Table 175: The change in the mass of ^{143}Nd for each assembly shown in Figure 93. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{143}Nd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

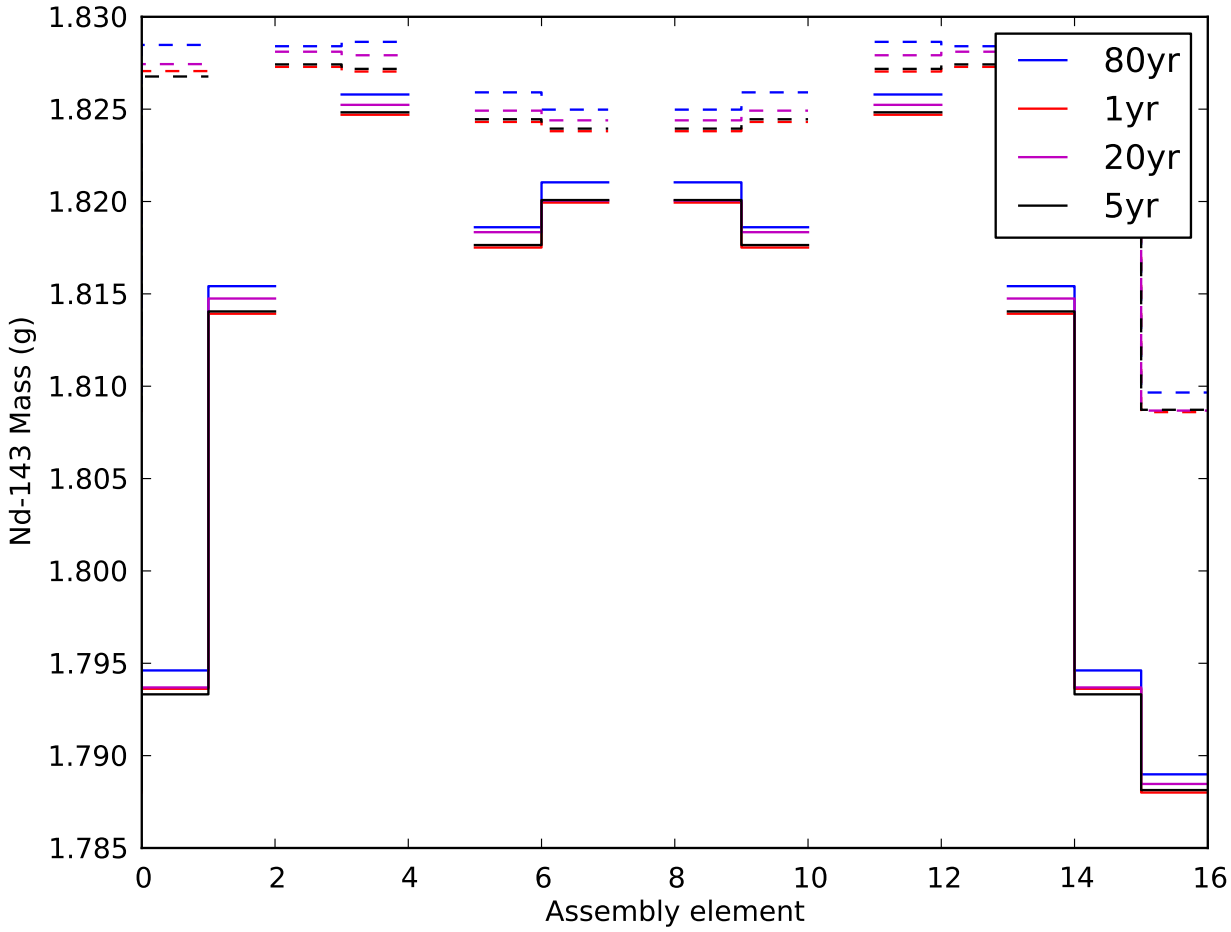
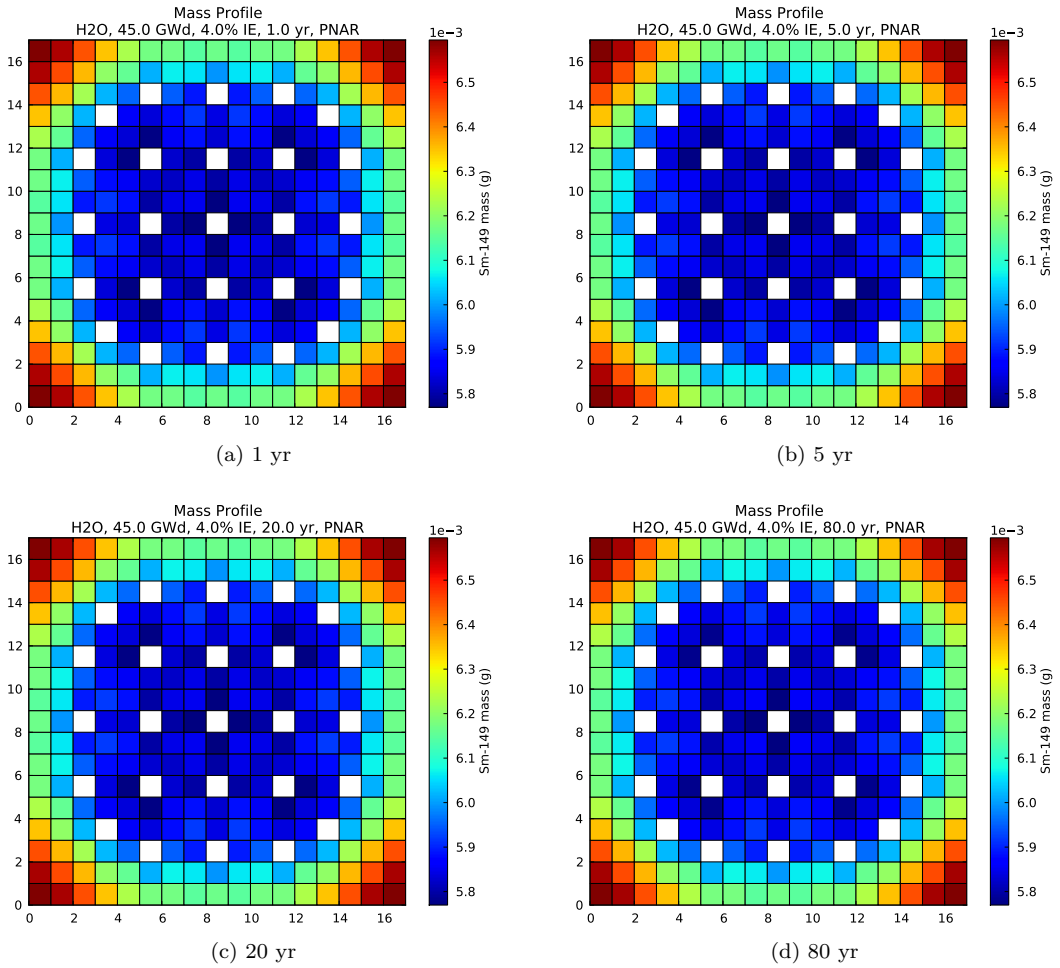


Figure 94: ^{143}Nd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.12 Sm-149



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 95: Change in mass of ^{149}Sm with an increase in Cooling.

Figure 95 shows the change in the mass of ^{149}Sm for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{149}Sm (1.596 g) occurs when Cooling is 80 yr, and the smallest mass (1.594 g) occurs when Cooling is 1 yr; the overall change in mass is 0.07 %. The change in the mass of ^{149}Sm in the individual assemblies is given in Table 176.

Parameter	min (location)	max (location)	% diff
1	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48
5	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48
20	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48
80	0.0058 (-1, 0, 0)	0.0066 (-8, -8, 0)	12.48

Table 176: The change in the mass of ^{149}Sm for each assembly shown in Figure 95. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{149}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

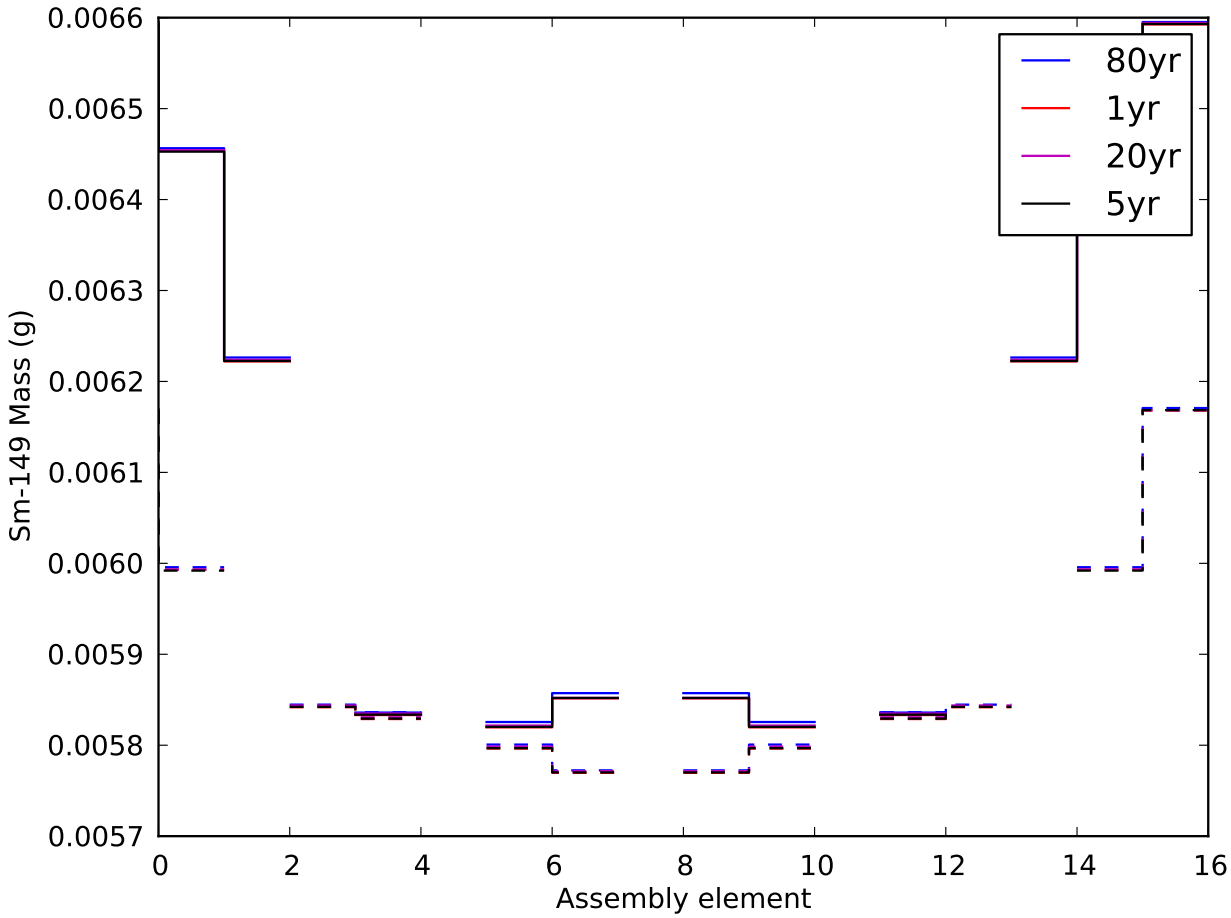
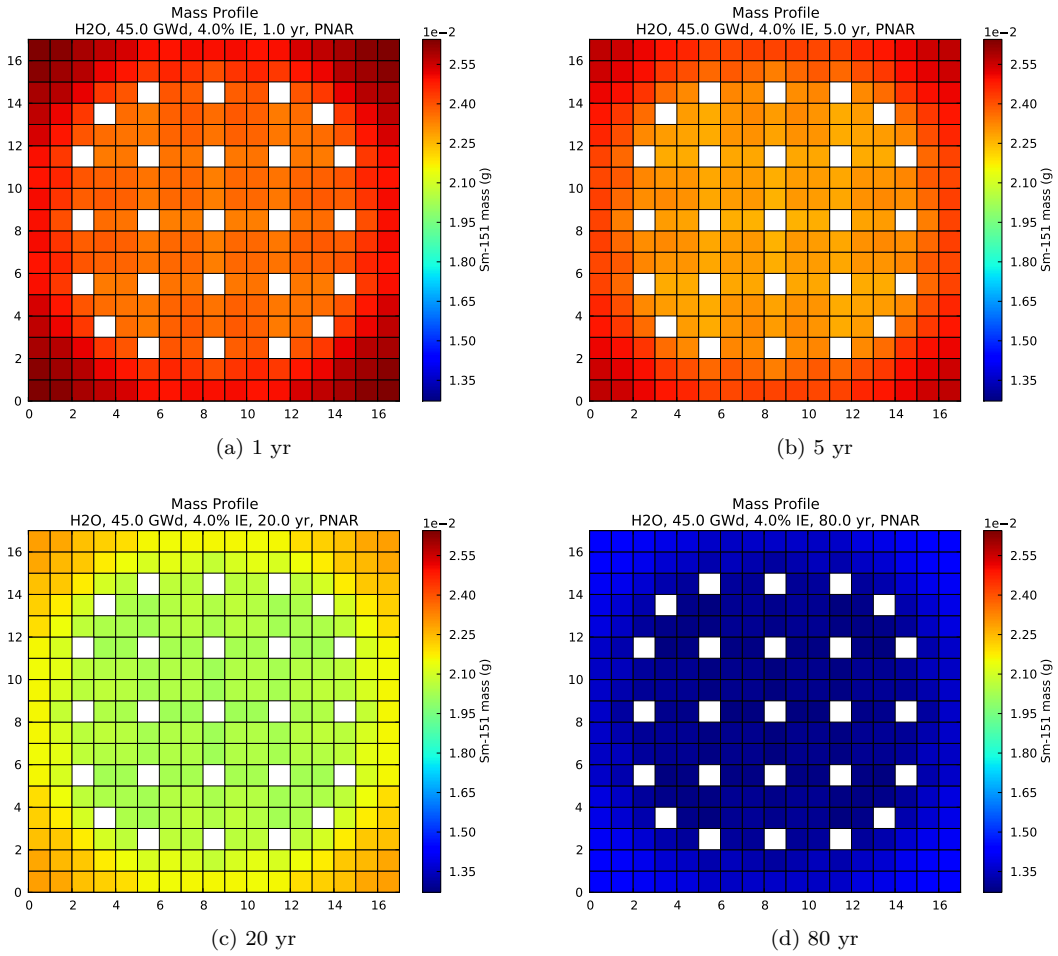


Figure 96: ^{149}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.13 Sm-151



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 97: Change in mass of ^{151}Sm with an increase in Cooling.

Figure 97 shows the change in the mass of ^{151}Sm for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{151}Sm (6.446 g) occurs when Cooling is 1 yr, and the smallest mass (3.51 g) occurs when Cooling is 80 yr; the overall change in mass is 45.54 %. The change in the mass of ^{151}Sm in the individual assemblies is given in Table 177.

Parameter	min (location)	max (location)	% diff
1	0.0233 (-1, 0, 0)	0.0264 (-8, -8, 0)	11.75
5	0.0226 (-1, 0, 0)	0.0256 (-8, -8, 0)	11.74
20	0.0202 (-1, 0, 0)	0.0229 (-8, -8, 0)	11.74
80	0.0127 (-1, 0, 0)	0.0144 (-8, -8, 0)	11.73

Table 177: The change in the mass of ^{151}Sm for each assembly shown in Figure 97. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{151}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

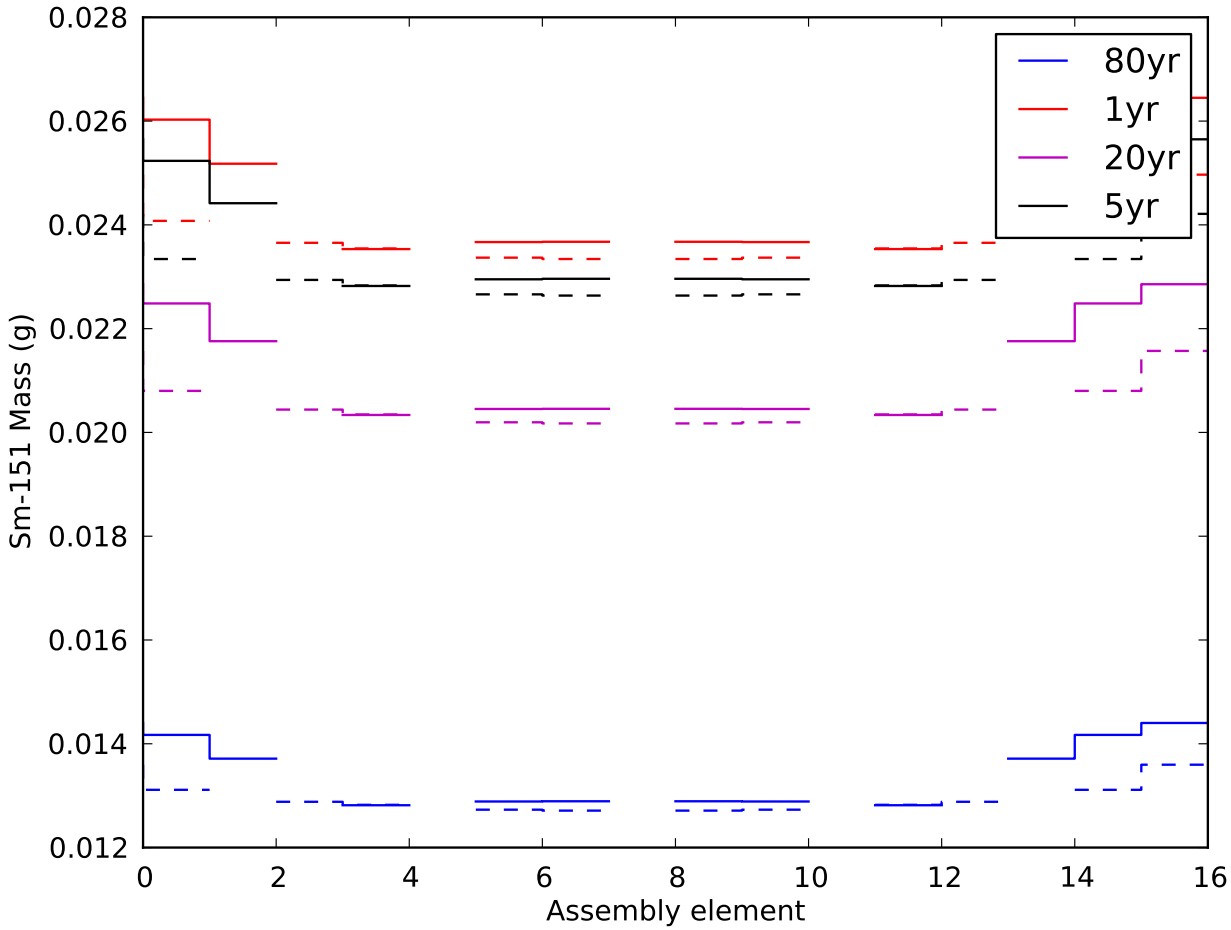
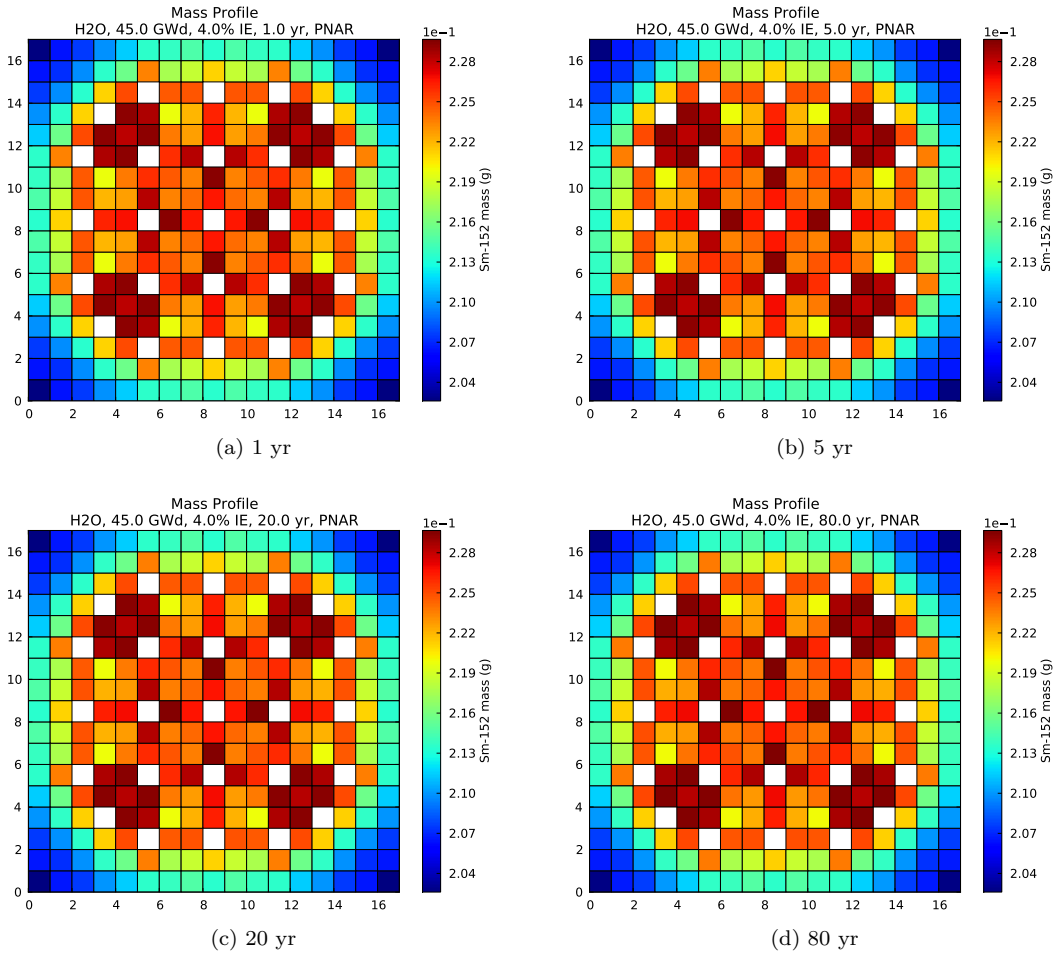


Figure 98: ^{151}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.14 Sm-152



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 99: Change in mass of ^{152}Sm with an increase in Cooling.

Figure 99 shows the change in the mass of ^{152}Sm for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{152}Sm (58.02 g) occurs when Cooling is 80 yr, and the smallest mass (57.97 g) occurs when Cooling is 1 yr; the overall change in mass is 0.08 %. The change in the mass of ^{152}Sm in the individual assemblies is given in Table 178.

Parameter	min (location)	max (location)	% diff
1	0.2026 (-8, -8, 0)	0.2294 (2, 0, 0)	11.69
5	0.2026 (-8, -8, 0)	0.2294 (2, 0, 0)	11.69
20	0.2027 (-8, -8, 0)	0.2295 (2, 0, 0)	11.70
80	0.2027 (-8, -8, 0)	0.2297 (2, 0, 0)	11.72

Table 178: The change in the mass of ^{152}Sm for each assembly shown in Figure 99. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{152}Sm in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

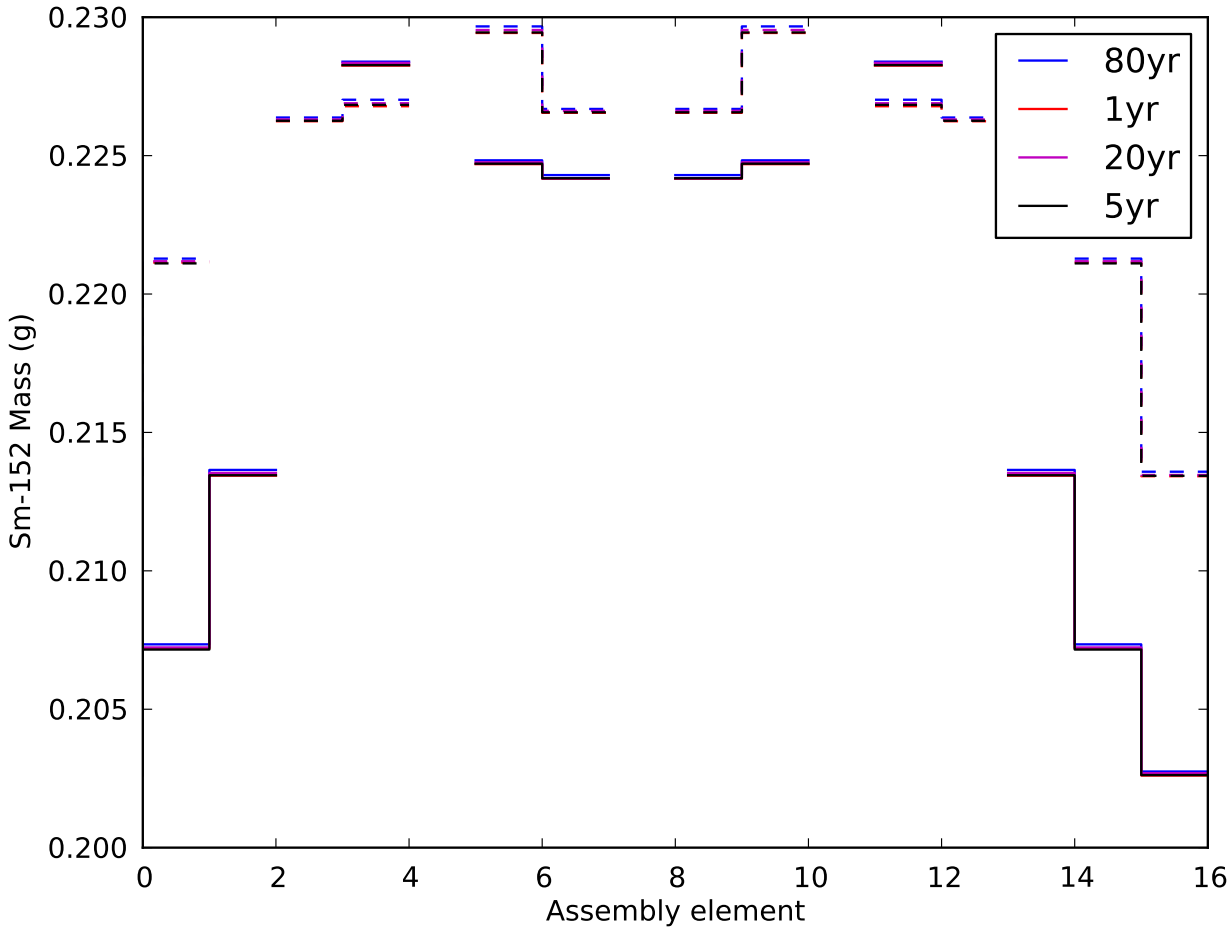
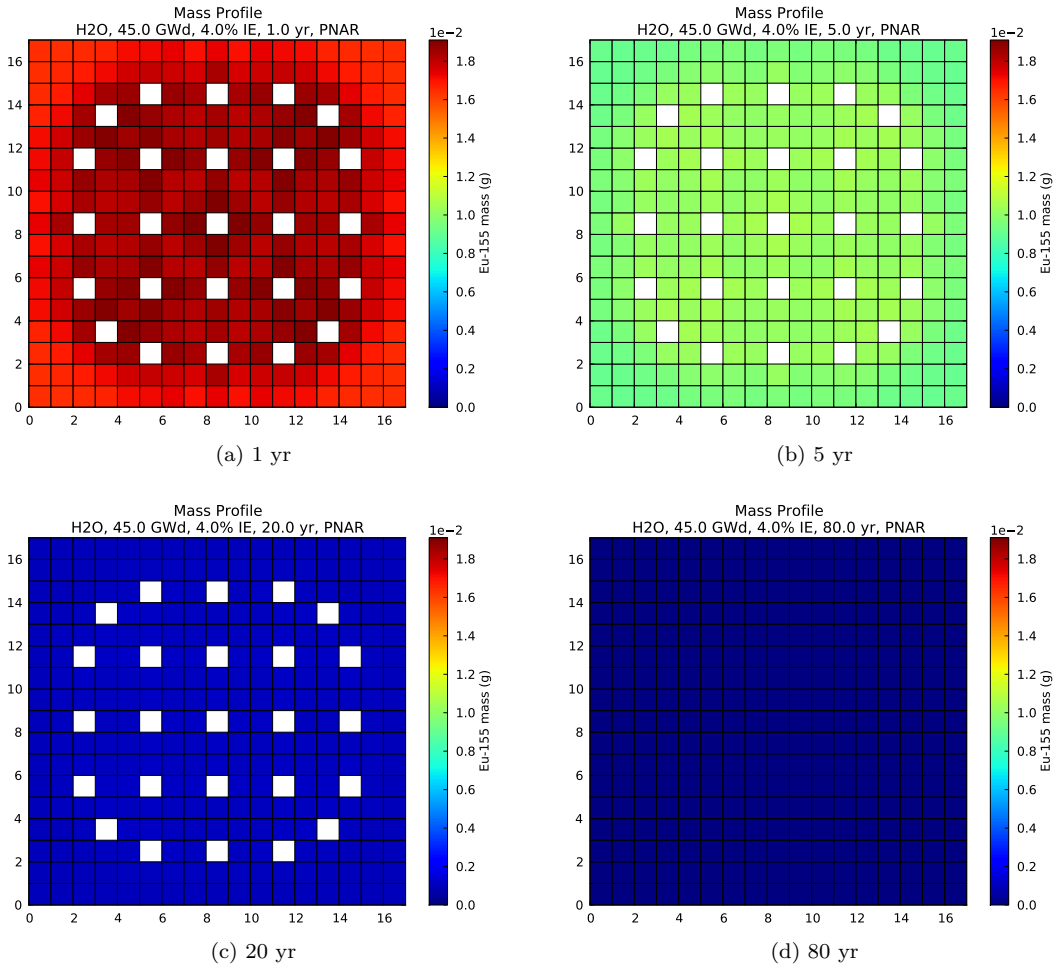


Figure 100: ^{152}Sm mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.15 Eu-155



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 101: Change in mass of ^{155}Eu with an increase in Cooling.

Figure 101 shows the change in the mass of ^{155}Eu for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{155}Eu (4.73 g) occurs when Cooling is 1 yr, and the smallest mass (0 g) occurs when Cooling is 80 yr; the overall change in mass is 100.00 %. The change in the mass of ^{155}Eu in the individual assemblies is given in Table 179.

Parameter	min (location)	max (location)	% diff
1	0.0165 (-7, -8, 0)	0.0191 (-1, 0, 0)	13.87
5	0.0091 (-7, -8, 0)	0.0106 (-1, 0, 0)	13.85
20	0.0010 (-7, -8, 0)	0.0011 (-1, 0, 0)	13.86
80	0.0000 (0, 0, 0)	0.0000 (0, 0, 0)	0.00

Table 179: The change in the mass of ^{155}Eu for each assembly shown in Figure 101. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Eu in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

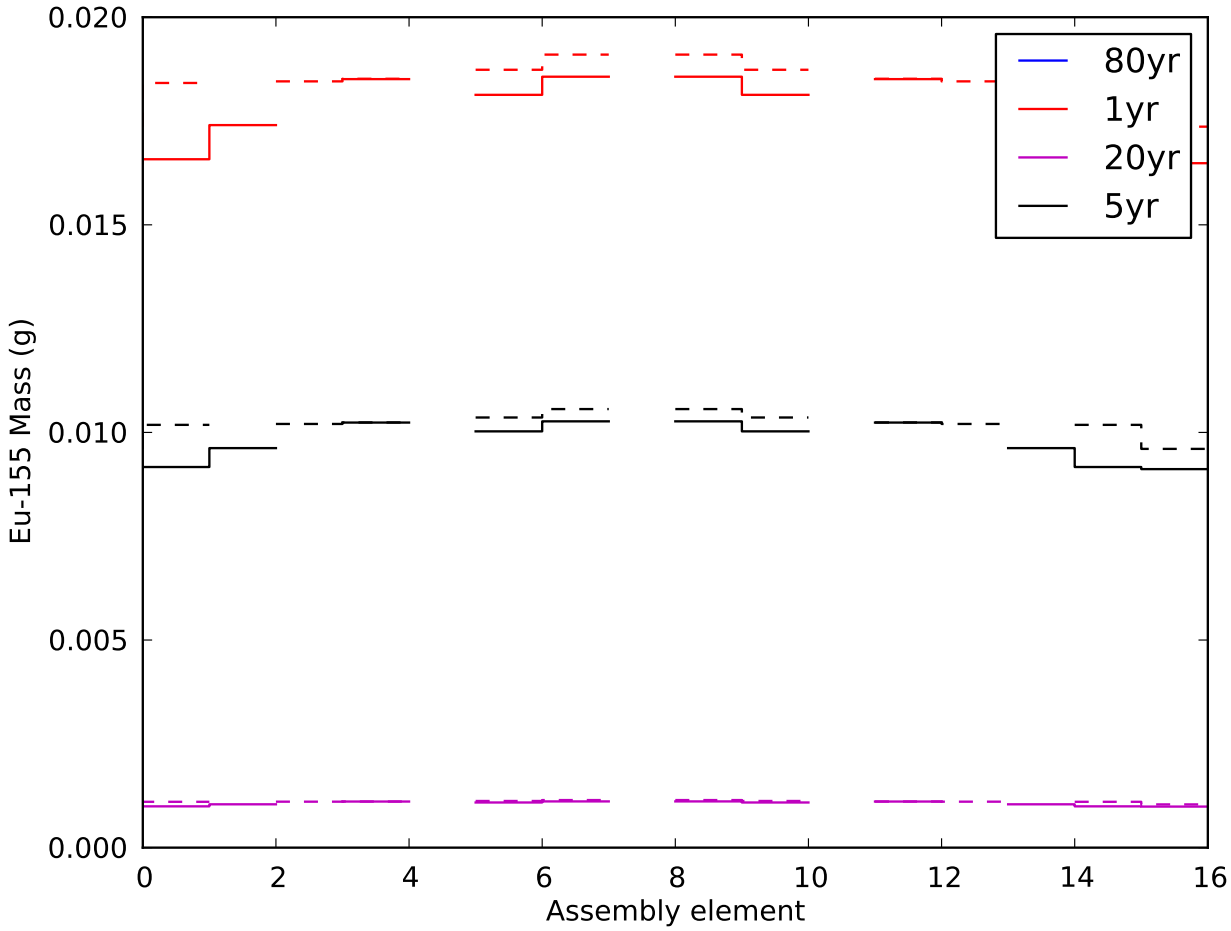
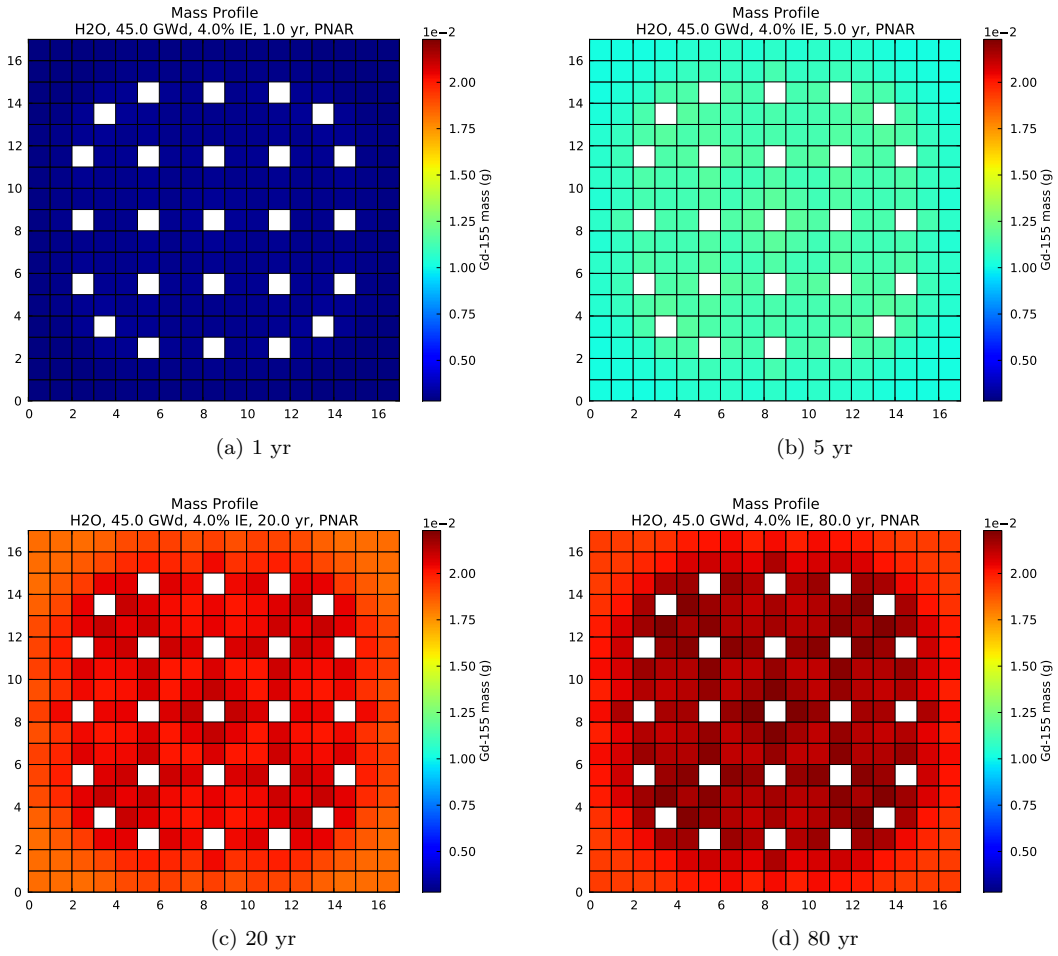


Figure 102: ^{155}Eu mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.16 Gd-155



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 103: Change in mass of ^{155}Gd with an increase in Cooling.

Figure 103 shows the change in the mass of ^{155}Gd for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{155}Gd (5.531 g) occurs when Cooling is 80 yr, and the smallest mass (0.7978 g) occurs when Cooling is 1 yr; the overall change in mass is 85.58 %. The change in the mass of ^{155}Gd in the individual assemblies is given in Table 180.

Parameter	min (location)	max (location)	% diff
1	0.0028 (-7, -8, 0)	0.0032 (-1, 0, 0)	12.31
5	0.0102 (-7, -8, 0)	0.0117 (-1, 0, 0)	13.44
20	0.0183 (-7, -8, 0)	0.0212 (-1, 0, 0)	13.62
80	0.0193 (-7, -8, 0)	0.0223 (-1, 0, 0)	13.62

Table 180: The change in the mass of ^{155}Gd for each assembly shown in Figure 103. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{155}Gd in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

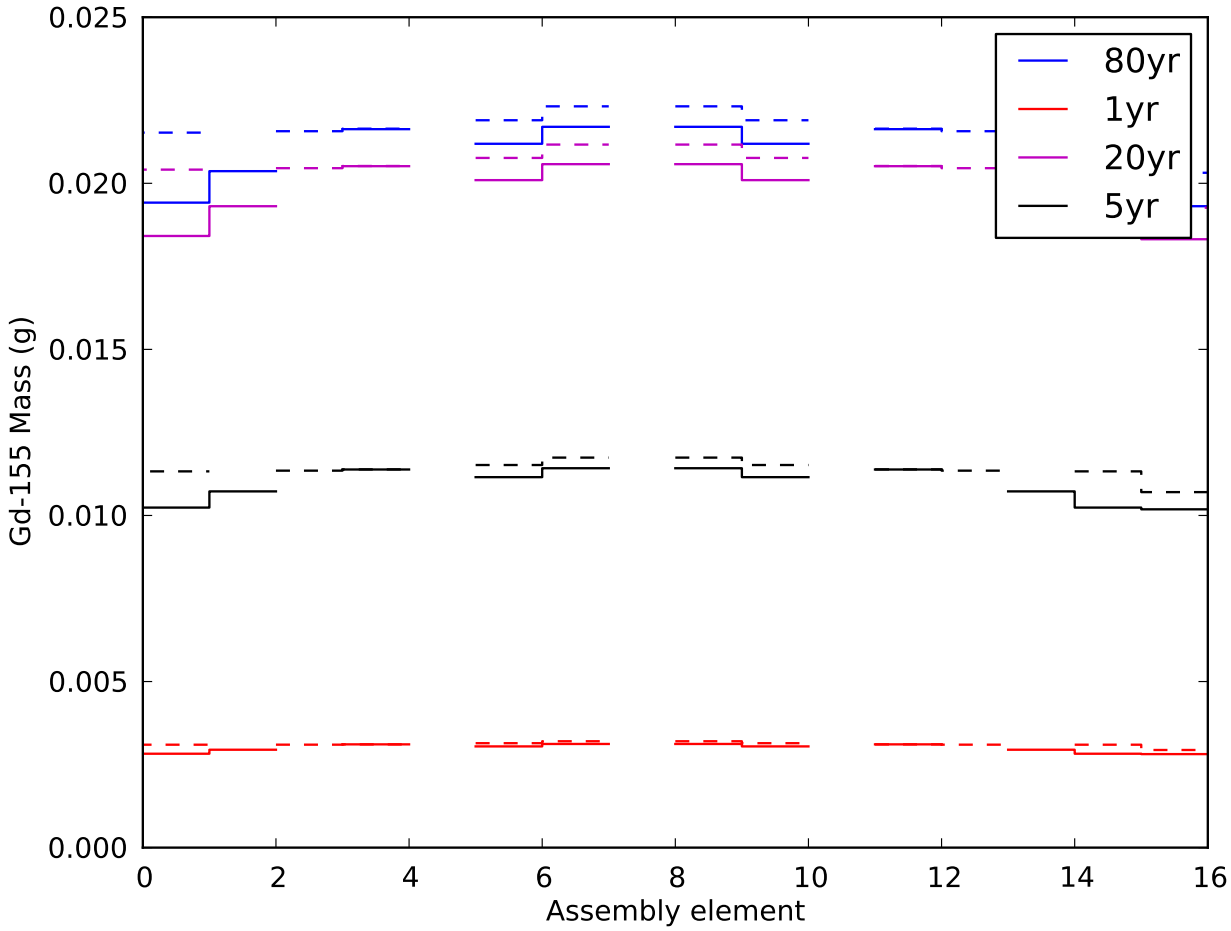
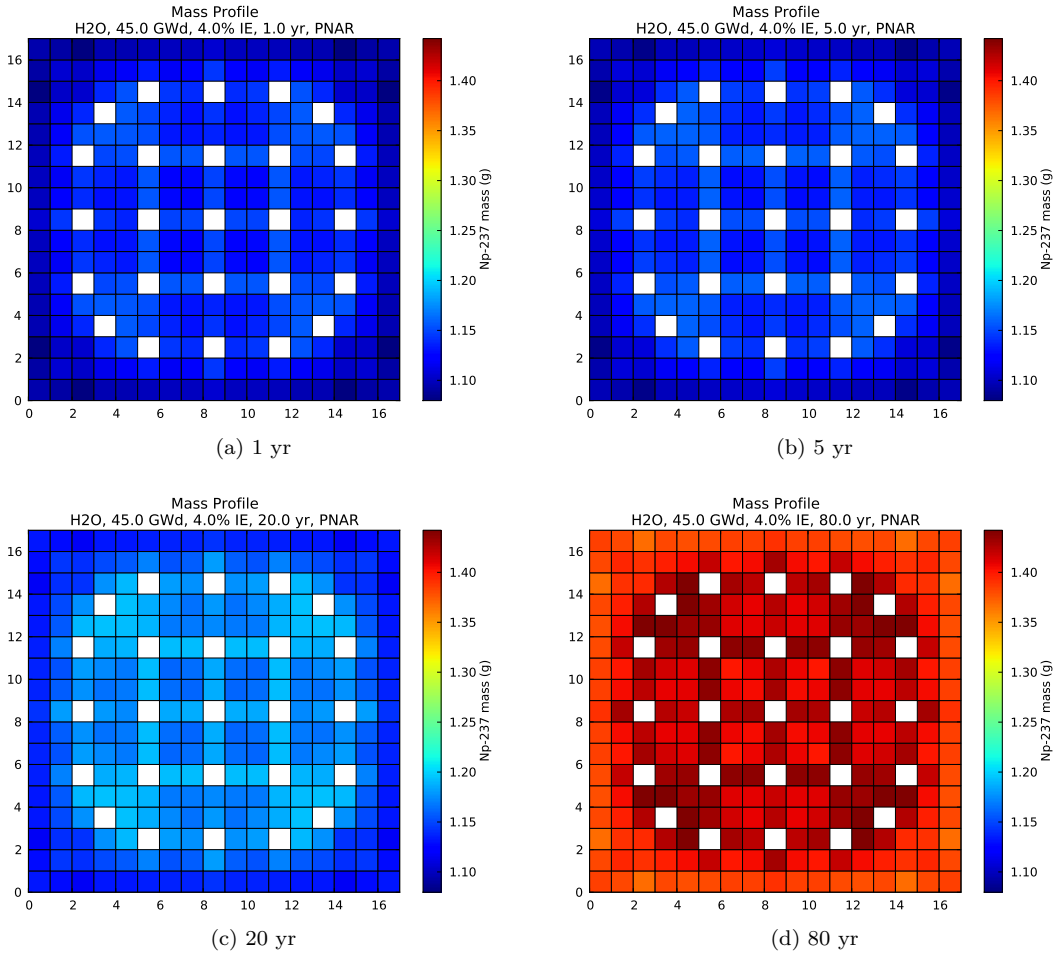


Figure 104: ^{155}Gd mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.17 Np-237



(a) 1 yr

(b) 5 yr

(c) 20 yr

(d) 80 yr

Figure 105: Change in mass of ^{237}Np with an increase in Cooling.

Figure 105 shows the change in the mass of ^{237}Np for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{237}Np (372.1 g) occurs when Cooling is 80 yr, and the smallest mass (297.2 g) occurs when Cooling is 1 yr; the overall change in mass is 20.13 %. The change in the mass of ^{237}Np in the individual assemblies is given in Table 181.

Parameter	min (location)	max (location)	% diff
1	1.0797 (6, -8, 0)	1.1564 (4, -5, 0)	6.64
5	1.0828 (6, -8, 0)	1.1596 (4, -5, 0)	6.62
20	1.1170 (6, -8, 0)	1.1935 (4, -5, 0)	6.42
80	1.3683 (6, -8, 0)	1.4422 (-4, 6, 0)	5.12

Table 181: The change in the mass of ^{237}Np for each assembly shown in Figure 105. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{237}Np in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

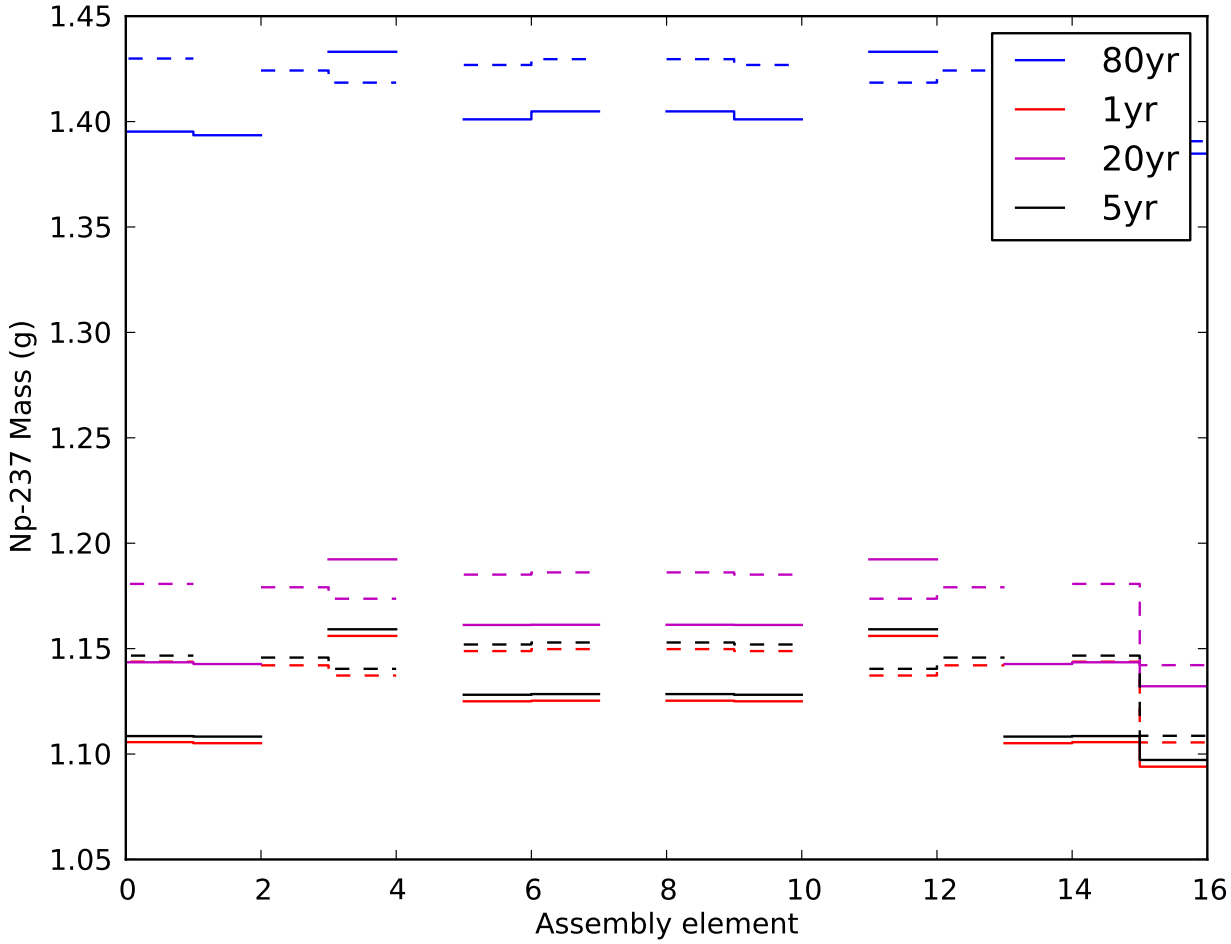
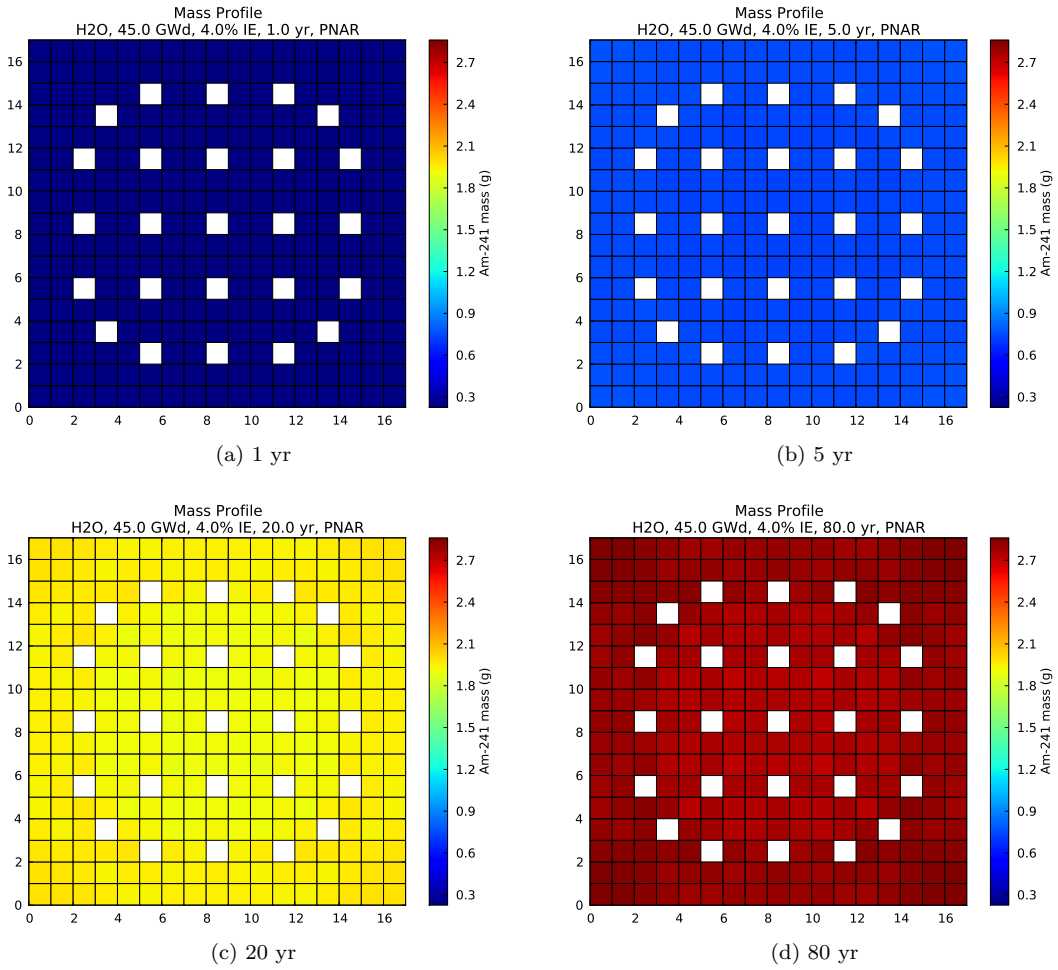


Figure 106: ^{237}Np mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.

4.18 Am-241



(a) 1 yr (b) 5 yr

(c) 20 yr (d) 80 yr

Figure 107: Change in mass of ^{241}Am with an increase in Cooling.

Figure 107 shows the change in the mass of ^{241}Am for a change in Cooling; the range of Cooling is 1–80 yr. The largest mass of ^{241}Am (736.5 g) occurs when Cooling is 80 yr, and the smallest mass (61.66 g) occurs when Cooling is 1 yr; the overall change in mass is 91.63 %. The change in the mass of ^{241}Am in the individual assemblies is given in Table 182.

Parameter	min (location)	max (location)	% diff
1	0.2260 (2, 0, 0)	0.2445 (-8, -8, 0)	7.56
5	0.7201 (2, -2, 0)	0.7636 (-8, -8, 0)	5.68
20	1.8902 (2, -2, 0)	1.9932 (-7, -8, 0)	5.17
80	2.7152 (2, -2, 0)	2.8609 (-7, -8, 0)	5.09

Table 182: The change in the mass of ^{241}Am for each assembly shown in Figure 107. The quantities min and max indicate the minimum (nonzero) and maximum mass of ^{241}Am in a single fuel pin. The location indices indicate where the fuel pin where the minimum or maximum occurs; location (0,0,0) is the middle fuel pin.

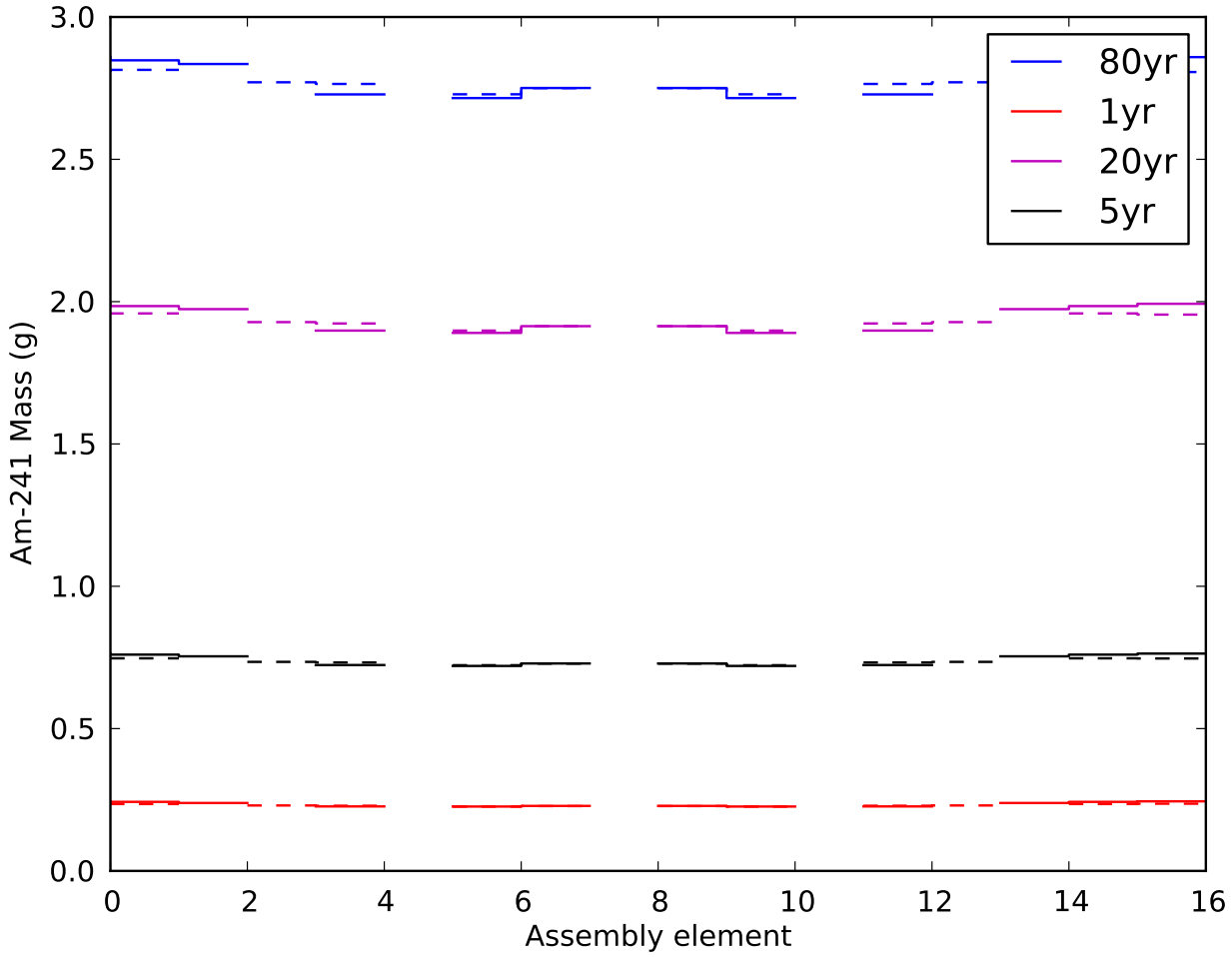


Figure 108: ^{241}Am mass profile across assembly. Solid lines represent the diagonal profile; dashed lines represent the profile across middle of assembly. Blank regions are the locations of the holes.